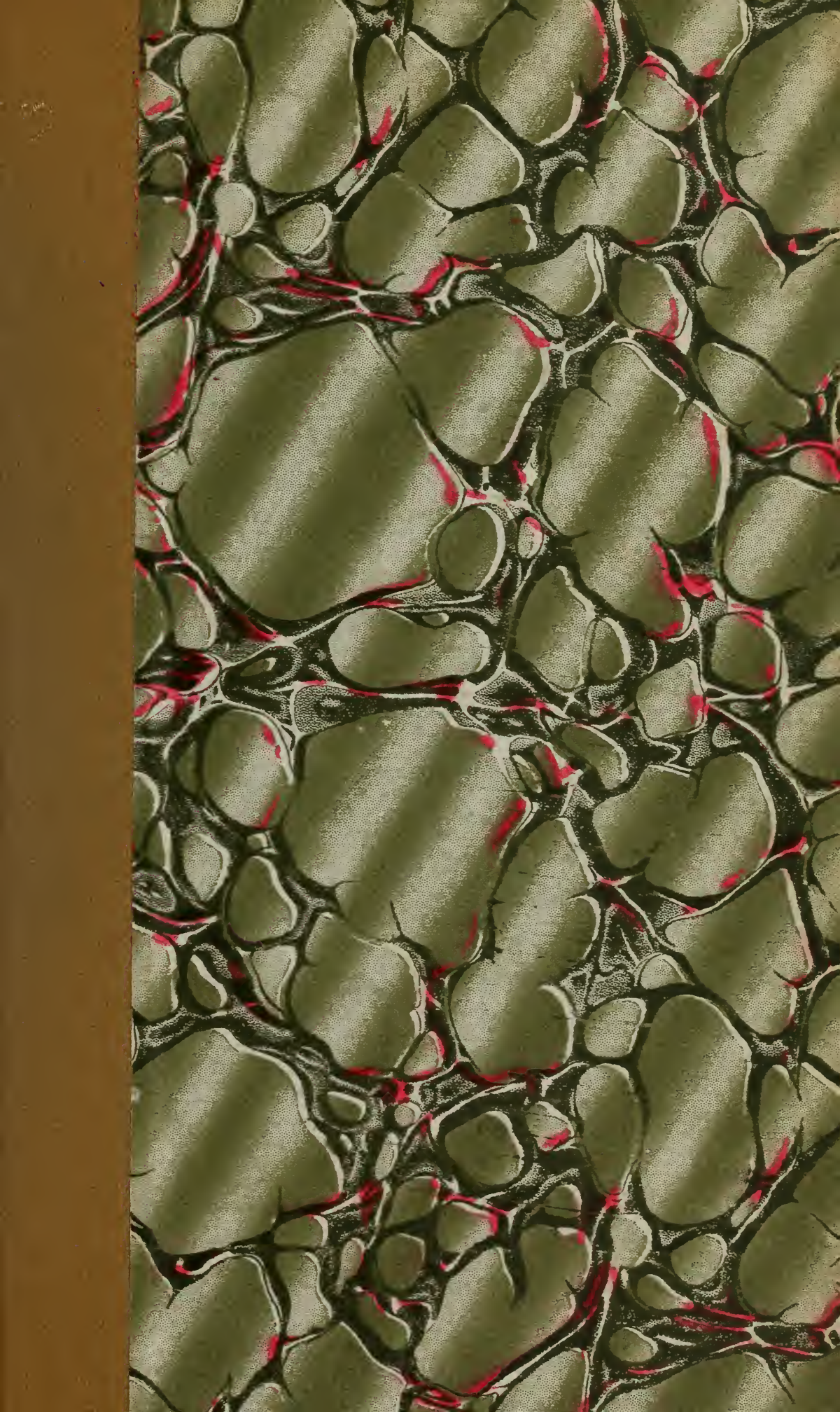

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THE

Missouri Dental Journal.

A

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CONTENTS — VOL. II.

PAGE.

Adamantine Plates..... 28
A Bill for the Suppression of Dental Quackery..... 68
Alveolar Abscess—Judd—92, 136, 145, 210 260, 292, 331, 365, 425
Address before the St. Louis Microscopical Society.—H. C. Gill, M. D 81
Adhesive Gold Foil—its Discovery and Use 97
Are the Mineral Acids Formed in the Mouth?—E. C. Chase..... 167
American Dental Association..... 239
A Calcified Pulp.—H. S. Chase..... 250
Adhesive Gold Foil..... 267
Association as an Element of Improvement.....289, 321
American Dental Association..... 318
Alveolar Abscess—W. S. Elliott..... 334
American Dental Association..... 360
Amalgam 434
Aluminum as a Base for Artificial Dentures..... 475
Bogus Diplomas—Judd..... 65
Bromide of Potassium in Dentition..... 233
Book Review..... 277
Bibliographical Notices—
Thomas on Nitrous Oxide..... 343
Dental Information for the People..... 343
Transactions of the Illinois State Dental Association 343
Brooklyn Dental Society 399
Canada Journal of Dental Science 40
Clinical Experience with Chloral..... 60
Cheap Plates.—Judd 63
Chicago Dental Society 110, 200
Case of Difficult Dentition.—Brewer..... 138
Cheap Dentistry 151
Cheap Bases.—Eames 187
Chicago Microscopical Society..... 200
Chloral Hydrate as a Remedy for Sensitive Dentos.—Mowbray 214
Constitution and By-Laws for Local Dental Societies 230
Children's Teeth.—Chase..... 251
Cast Aluminum Plates—Eames..... 276
Cylinder Fillings.—Chase..... 297

PAGE.

Clubs of all Dental Journals.—Driscoll... 397
Dental Education.—Mills..... 8
Dental Education in New Jersey..... 399
Extract from the Address of Dr. Hitchcock 89
Electric Plugger..... 339
Encysted Tumors.—Hamilton 374
Extracts from Prof Huxley's Address on the Origin of Life..... 401
Epulis 428
Filling Feeth.—Chase..... 94, 140, 184, 253
Finishing File.—Chase..... 144
Force, the Equivalent of Material Motion 281
Fracture of the Teeth..... 407
Gold Foils..... 80
Green's Pneumatic Engine..... 144
Gold Solder.—Eames..... 145
Gold Fillings.—Chase..... 275
Gold Plates with Rubber Attachment.—Eames..... 393
Heavy Foil.—Eames..... 20
Heavy Foils.—Chase..... 57
Hydrate of Chloral 85, 133
Heavy Foil for Filling Cavities in Teeth.—Atkinson 177
Heavy Foils.—Cushing..... 219
Heavy Mallets.—Cushing..... 262
Hydrate of Chloral.—Morrison 317, 340
Inserting the Gold.—Chase..... 54
In the Dentist's Chair..... 76
Illinois State Dental Association 234
Indiana State Dental Association, 238, 314, 317
Inflammation of the Gums and Lips.—Chase 424
Inflammation of the Antrum..... 459
Journal Stock Fund..... 320
Little Items.—Forbes 120
Labor Saving Machines.—Eames..... 228
Letter from Geo. J. Pack..... 437
Missouri Valley Dental Society..... 39
Mortuary Report.—Chase.....40, 80
Mallets.—Chase..... 143
Mendacious Quacks and Respectable Indorsers..... 197
Missouri State and Dental College Association 198, 236

PAGE.

Monument to Dr. Horace Wells..... 240
Missouri State and Dental College Association—Notice..... 279
Mechanical Dentistry..... 299
Microscopy of a Deciduous Tooth.—Cutler..... 368
Medullary Carcinoma of the Antrum..... 437
Medicine in India..... 460
Notes on an Article from Lionel S. Beale—Cutler..... 12
Necrosis—Chase..... 105
Nickel Plating..... 109
National Association..... 238
New Form of Neuralgia of Jaw Bones..... 433
New Jersey State Dental Association..... 438
Operations for the Cure of Cleft Palate..... 1
Of What Use are our Professional Meetings—F..... 47
Oxychloride of Zinc as a Capping—Smith. 59
One of my Failures—Brewer..... 195
On Replacement of Luxated Teeth—C.A.P. Garnsey..... 216
On Nutrition, with Especial Reference to the Importance of Phosphates—Ott... 283
Office Jottings—Black..... 370
Obituary.—Dr. J. W. Dennis..... 476
Preparation of Cavities—Chase.....24, 49
Poly-Cystic Tumor of the Antrum—Chase 50
Practical Hints—Preservation of Roots—Brewer..... 52
Parotid Duct Compressor—Chase..... 106
Plaster Impression for Partial Set—Kitchen..... 119
Patent Humbugs—Chaffee..... 148
Progress of Microscopical Science..... 201
Professor Noel's Reply..... 245
Proceedings of the Iowa State Dental Society..... 305
Proceedings of the California State Dental Association..... 344
Porcelain vs. Other Materials..... 383
Plugging Teeth—Chase..... 418
Root Filling—Chase..... 15
Report on Vegetable Parasites—Davis..... 41
Repairing Artificial Work.....108, 159

PAGE.

Root Enlargement—Wilson..... 137
Replacement of Luxated Teeth—E. C. Chase..... 181
Replacement of Luxated Teeth—M. A. Spence..... 226
Replacement of Luxated Teeth—S. B. Brown..... 227
Rolled Gold for Filling Teeth—Shadoan... 296
Removal of Salivary Calculus—Chase..... 422
Saving the Pulp Alive.—Chase..... 25
Sensitive Dentine—Chase.....26, 107
St. Louis Microscopical Society..... 34
Serrating Gauge—Willis..... 66
Stray Thoughts—Brewer..... 153
Southern Dental Convention..... 190
South Carolina State Dental Association... 237
Separating Teeth—Black..... 255
Sensitive Dentine..... 398
The New Year—Judd..... 27
The Hardman Compound—Hardman..... 36
The Quebec License..... 71
The Cincinnati Medical Repertory..... 73
The Relation of the White Blood Corpuscles to Suppurative Inflammation..... 121
To Cast Aluminum Plates—Eames..... 146
The American Journal of Dental Science.. 155
The Object and Aim of the San Francisco Dental Association..... 161
The Past and Present of Dentistry—Smith. 171
Thymol, a New Disinfectant..... 196
The Origin of the White Corpuscles..... 204
The Relative Value of Heavy and Light Mallets in filling Teeth—Dean..... 206
The Arts—Judd..... 229
The Boston Medical and Surgical Journal—Judd..... 241
Tin Foil—Chase..... 294
Things we See..... 341
The Moral of Thoroughness in Dentistry—Dennis..... 361
The Rubber Dam..... 389
The Real Nature of Disease Germs..... 441
The Anglo-American Ambulance in the European War..... 472
What is a Cell?..... 456

The Missouri Dental Journal.

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OPERATIONS FOR THE CURE OF CLEFT PALATE.

Extracted from the "Transactions of the American Medical Association for 1869."

Dr. Lewis A. Sayre, of New York, presented, by request, the following paper of Dr. Whitehead of New York, which described the mode adopted by him in operations for the cure of cleft palate, involving the partial destruction of the palatine processes of the superior maxillary bones.

"One of the earliest descriptions of an obturator for the occlusion of acquired defects of the palatine vault is due to Ambroise Paré.

"The first attempt to close, by a surgical operation, fissure of the soft palate was made in 1816 by Graefe of Berlin, but the first successful operation for this infirmity was accomplished by Roux in 1819. The operation of staphyloraphy soon acquired a prominent position in the eyes of surgeons, and found much favor with some who skillfully imitated Roux's ingenious example.

"The names of a number of American surgeons are favorably associated with the early history of this operation. Distinguished among them are those of J. Mason Warren, of Mass., Pancoast, of Penn., and Mettauer, of Virginia. The successful operations for cleft of the soft palate stimulated Roux, Kreimer, Warren, and others to essay the closure of fissures of the hard palate. A very successful case by Warren, attested the triumph of American surgery over the efforts of Roux and others. Furguson, by a proper division of the levator palati muscle, improved the operation of staphyloraphy, and made its success more certain.

Pollock, in detaching the mucous membrane from the gums and palatine vault by judiciously conducted incisions, has in a number of cases, as has also Baizeau, closed apertures of the hard palate. This, however, J. Mason Warren had already done. More recently, Langenbeck, by detaching the muco-periosteal coverings of the gums and roof of the mouth, has closed extensive clefts of the hard palate, and, in a certain proportion of cases, obtained a development of new bone, which occluded the palatine openings.

"Langenbeck, Simon, Billroth, Beck, and other German surgeons have quite fully established this operation; especially the first two, who have repeatedly closed, at one operation, wide clefts involving both the hard and soft palate. This I have successfully accomplished; but I regret that my opportunities have been so limited as not to permit me to speak with the confidence that I would wish; nevertheless, I can satisfactorily answer the essential questions of interest pertaining to the subject of this report. I feel confident that more extended opportunities will quite confirm the opinions which I now entertain regarding the treatment of cleft palate generally. There are marked differences in the size, form, and general appearance of cleft palates. They are naturally divided into those which are congenital and those which are the result of disease. Congenital cleft of the palate may extend entirely through both the hard and the soft palate, and be complicated with complete fissure of the alveolar process and with harelip. Usually the cleft is less extensive; generally, it involves only the palatine bones and the soft palate. The fissure may be median or lateral—most frequently on the left side. Sometimes there is a double fissure of the vault, with separation of the velum. It is rare to see congenital cleft of the hard palate with the soft palate intact. Occasionally the fissure is very much on one side, the opposite side of the vault being normal, and its surface continuous with the vomer, which, with the turbinated bones, may be plainly seen through the fissure. There are many peculiarities in this infirmity. Sometimes there is an ugly projection of the intermaxillary bones, complicated with double harelip. A depression of the edges of the cleft; an

incomplete development of the velum; a flattened form of the palatine vault, and the height of the alveolar processes, are conditions which require an attentive consideration for the proper treatment of congenital cleft of the palate. Not less important is the width of the cleft and complications, such as harelip, which may be accompanied with an exaggerated size of the nostrils. These defects sensibly affect the speech after the successful occlusion of a cleft palate by surgical means or by an obturator. The mental aptitude of the patient, in his efforts at distinct articulation, will considerably influence the result of the treatment. Apertures in the palate caused by disease or by wounds, are necessarily less uniform in appearance than congenital deficiencies of this part. The acquired defects are rarely attended with a cleft of the velum. After this brief preliminary sketch of the subject, I shall describe those selective means which, in my judgment, are the best methods of treatment for cleft palate. It is not exclusively by one mode of treatment that the best results are obtained; but it is worthy of observation, that within a few years, the surgical treatment of cleft palate has acquired an importance which deservedly places it in the first rank. The operation for a cleft involving only the soft palate, and known as staphyloraphy, need not occupy our attention, except as regards its influence on the speech. The closure of defects of the hard palate, attended, or not, with separation of the velum, by the method which, in a large number of cases, is the most desirable, and known by the name of muco-periosteal uranoplasty, is due to the fertile genius of Langenbeck. For a correct understanding of this method, it is necessary to recall to mind the distribution of the arteries of the roof of the mouth. At the junction of the horizontal plates of the maxilla and palate-bones with the alveolar process, there is a groove, in which courses the superior palatine artery. This artery, which is of considerable size, emerges from the orifice of the posterior palatine canal, and after running along in the groove ascends through the anterior palatine canal, anastomosing with its congener and the naso-palatine. Some small branches, which emerge from the accessory palatine canals, contribute to nourish the velum. The proper

disposition of the incisions, and the protection of the arteries from injury, insure the nutrition of the muco-periosteal coverings, which form the flaps in Langenbeck's operation. Having simplified some of the instruments and used an efficient gag in this operation, I shall describe it as I have successfully performed it, and not as described by Langenbeck and others. The original conception of a gag somewhat similar to this one is claimed for Dr. Mussey, of Cincinnati, by Mr. Stohlmann, of the firm of Tiemann & Co., New York, makers of surgical instruments; Dr. Louis Elsberg, of New York, first called my attention to this instrument, and proposed for it a tongue-depressor. Mr. Stohlmann has recently made in this gag some slight, but useful, modifications. Mr. T. Smith, of London, has also used a gag with a tongue depressor, in staphyloraphy on children."

In describing the method of operating, the author says the operation is commenced by dividing the palato-pharyngeus and the palato-glossus on each side.

The levator palati is next thoroughly cut, and the point of the knife should be passed around and behind the hamular process, from without inward, and over the lower and inner surface of the internal pterygoid plate, and along the posterior border of the palate bone to the cleft. In this manner the mucous membrane is cut, which confines each half of the velum, even after the section of the levator palati, and the flaps fall together, when other stages of the operation are completed.

An incision is next made along the edges of the cleft, and afterwards the side cuts, which extend slightly beyond the last molars and to about the eye teeth.

These cuts are made through the periosteum to the bone.

The periosteum is then detached, taking care to respect the parts around the orifices of the posterior and anterior palatine canals, so as to avoid impairing or destroying the vitality of the flaps by injury to the posterior palatine artery.

This artery is contained in the flaps, and is lifted with them from the bone in detaching the periosteum. * * *

"In detaching the periosteum there is usually very little

bleeding. There is often more in cutting the levator-palati muscle. Formerly, during the operation known as *mucous-uranoplasty*, there was often troublesome hæmorrhage, but this rarely occurs when the periosteum is detached. In acquired defects of the palatine vault, from disease or other causes, and when the soft palate is intact and there is a bridge of bone remaining behind the hole in the vault, to which bony bridge the soft palate is firmly attached, it is obviously unnecessary to cut the muscles of the velum. Otherwise they should be cut, or the operation will fail, because they are constantly, by their contractions, exerting a strain on the sutures. The success of this operation has been fully established in Germany. Only in a certain proportion of cases has there been a reproduction of bone from the periosteum. The result obtained by the operation, in properly selected cases, is superior to that of any other mode of treatment. I do not think, like Langenbeck, that the operation is suited to nearly every case. There are cases where it is impossible of application—that is, in those where there is not amply sufficient tissue to form the flaps. In such cases a properly adjusted obturator is better than any operation. If there is quite an incomplete development of the bifid velum and the cleft is very wide, the newly formed palate will be very tense, and the speech, even if distinct, will generally remain strongly nasal, because the new velum will be too short and its movements too limited to occlude the buccal from the nasal cavities. The advantages of the operation, however, in such cases, would be to procure an improvement in speech and prevent the nasal secretions from flowing downward into the throat and stomach. It is especially in acquired defects of the palatine vault, when there is not too great a destruction of the parts, that this operation is attended with the happiest results, in the immediate restoration of the normal speech, The cause of nasal tone in persons not affected with cleft palate is often due to inefficient contraction of the levator and tensor palati muscles, concurrently with the contraction of the constrictor pharyngis superior. The contraction of these muscles should make the velum and posterior wall of the pharynx approach in such a manner as to shut off the buccal from the nasal cavity.

If the occlusion is incomplete, as in the temporary paralysis of the soft palate, from diphtheria, the voice will hardly escape through the nose. To bad habit of speech is rightly attributed nasal tone in a large number of persons with well-formed palatine organs. I have observed, on the contrary, a remarkable distinctness of speech, with greatly-lessened nasal accent, to follow careful and intelligent efforts at articulation, when the newly-formed velum was quite insufficient to occlude the pharyngeal from the nasal cavity. Sometimes a more permanent impairment of speech may result from an extensive notching of the pillars of the fauces, in a careless incision of the tonsils, than would be occasioned by the cicatricial retraction of the muscles of the palate after a successful operation of staphyloraphy." * *

"In young children, forcible compression of the maxillæ with a suitable mechanical device, will sometimes produce a very rapid and sensible lessening of a cleft of the palatine vault, causing, however, deformity of the upper jaw."

"Dr. Sayre remarked that the gist of the paper consisted in the recommendation of incisions antero-posteriorly, near the alveolar margin of the palate, and the inclusion of the post-palatine arteries in the mass of tissue to be used in closing the aperture.

"Dr. March, of New York, asked what effects resulted in regard to the improvement of speech, and also whether there was not exfoliation of bone after the periosteum had been detached.

"Dr. Douglas responded that the results were unfavorable in regard to improvement in speech, in which opinion Dr. Sayre concurred.

"Dr. Frissell, of West Virginia, stated that he had assisted in a number of cases where the operation had been performed, and in none had the speech been improved. Exfoliation is not apt to occur, because the bone is not cleanly stripped. He was not well satisfied as to the propriety of an operation, since the obturator (artificial) answered every purpose.

"Dr. Eve remarked upon the experience of a scientific dentist in Nashville, who had been engaged to assist in the mechanical work necessary for such cases, to the effect that the results after

operation had been so unsatisfactory in Europe, that the operation had been almost entirely abandoned."

REMARKS.

The peculiarities of the operation consist principally in the free incision, not only of the muscles but of the mucous membrane behind the hamular processes, and in the carrying forward with the flap the posterior palatine artery, which would furnish an abundant supply of blood for nutritious purposes, and which would undoubtedly contribute much to the success of the operation; and also in including in the flaps the periosteum, which, being carried along with them, would form a basis from which the osseous tissues of the palate might be developed and the organ rendered complete.

In two or three cases reported since in the New York journals this seems to have been accomplished, and if this turns out to be true, it may be set down to be a very decided success.

The details of the operation, with the exception of those given in the above extracts, do not differ materially from those laid down by other authors. Dr. Whitehead, however, recommends silver sutures, and remarks that they should be left in *fourteen days.*

The use of a gag for holding the mouth steadily open during the operation, has not generally been recommended, though it has occasionally been used by other operators.

The author barely alludes to the fact that the fissure may be approximated in young children by external pressure upon the jaws, but remarks that it causes a deformity of the upper jaw.

We opine that this is the really philosophical operation for the cure of this malformation, and the only one that will prove in a majority of cases generally successful. The bones may be brought in close proximity by the application of external pressure, and when brought together may be easily pared and a union secured, and in most cases, when taken at an early age, a bony union. Nature will do something towards correcting the deformity, and what is not accomplished in this manner may be easily done by appliances which any dentist of moderate ability can construct

and apply, though this would necessarily have to be postponed till a somewhat later period in life.

The remarks of the distinguished surgeons quoted above show sufficiently well what results are to be expected when the operation is delayed, and it seems to us that it is high time that the attention of the profession be more particularly directed to earlier operations with the hope of attaining better results.

J.

DENTAL EDUCATION.

Read by appointment before the Brooklyn Dental Society, Nov. 15, 1869, by George A. Mills.

Mr. President and Gentlemen:

Since commencing to write out my thoughts on this subject, before us to-night for discussion, I have so keenly felt my own deficiencies, that the effort has seemed useless. But, believe me, I have endeavored to do something; and present it to you with the sincere desire, that whatever truth may be discovered, it may be faithfully applied.

A man that abstains from food, will hunger; and a continuance of abstinence will cause what is termed by us *death.*

That nature demands food, no one denies; yet, by an aberration of the mind, one can cheat himself out of material existence, and compel his present habitat to give up the ghost, that has condescended to live with it at all.

The demands of the mental nature are like the material. If not supplied, it is dwarfed and loses its vitality. Therefore it ceases to extend its beneficial influences on the race.

To nourish the higher wants of the body, the best of food is required, outside of an artificial preparation; viz., the prevailing use of condiments in the dishes that are found on our tables day by day.

We do not provide a nourishment sufficiently concentrated; thus requiring the organs of digestion to perform such an extra amount of labor that they are weakened and impaired; therefore contributing largely to the extension of an abnormal

condition of the body, and an increase of the baser passions.

What the world needs, to extend an education that will facilitate its usefulness, is, "*association*, *stripped* of *all* false and foolish conventionalities, that are doing so much at this present day to impede the process of what constitutes an *education*, which carries a healthy and powerful influence wherever it is disseminated.

Education, in all the callings of life, *is terribly superficial*, with a seeming disposition to evade the *truth* in its simplicity.

There is an inherent disposition in man, and an utter dislike, to remaining in a state of childlike simplicity. We aspire to what we call *higher things;* forgetting that we will be totally unfitted to appropriate them in their proper places, and thus, by a misappropriation, they lose their *much* needed influence.

In our profession, with the *masses*, the tendency has been to ignore the foundation stones of our professional structure, which is made up of principles that are to be recognized, and without them it were *better* that we were hewers of wood and drawers of water. To willfully pass them unnoticed, is *criminal*—it is *murderous*. Why? it is asked. I answer, We are trampling on human life, which is so *sacred* that we *should* feel (though we may not) that we are on holy ground.

I can hardly believe that any one, however great his assumptions may be of his own abilities, is without strong convictions that his whole duty is not done while he neglects *any* opportunity to *instruct* or to be *instructed*.

The question often arises, Who shall be our teachers? I answer, He that is least, (or thinks himself to be) for such a one will speak out his best convictions of truth as they are presented to his mind.

Is there one among *us* who is too ignorant to teach, or in other words, impart his best convictions of truth, as they come to him through the newly irrigated brooklets of the mind? Or are there any that have passed through all these brooklets, creeks and great rivers, and are now out on the broad ocean, with favorable winds that betoken a successful voyage, outstrip-

ping (as they may think) all these smaller craft, and *now* cannot learn?

The fact that we exist to-night as an associated body, has taught us *much* of our abilities, and *much* of our inabilities.

At first we had doubts, that we could nourish the existence of a well-ordered Dental Society. But many a well-spread table of *choice viands* (both for the body and the mind) has given evidence of our bountiful supplies, and the avidity of our appetite.

To say that we have not grown in *body* and *mind*, would be a denial of the testimonies present with us. An old adage often quoted, "He who will not work, must not eat," is applicable to us.

The mind is better fed on a short diet; but it is highly proper, after a reasonable discussion of the food for the intellect, that we should pass from labor to that which will refresh the body. This Society has had an existence of a little more than two years, and I do not hesitate to declare that we have received an education that is indispensable to our prosperity in this *city* alone.

We have done *much* to establish our mutual admiration, and *respect* for each other; in other words, *confidence*, to an extent that did not *exist* before.

Now let us consider that we have somewhat gone through the process of coming together, and have shown some *fruitage*, and turn our individual attention to the work that we have *vowed* to perform. Our life *solely* depends on our activity. If we continue to eat and not work (and hard work, if it need be) we will become logy, fat, and lazy.

Now, our opportunities are golden; give them a large place in our hearts and hands. "Whatever our hands find to do, let us *do* it with our might." Let us be of one mind, as touching this one thing—our Dental Education; which is of such vital importance to *us* in our day, and to those who may come after us, and is one that calls upon the best attributes of our nature.

First of all is one, without which labor is onerous, and there cannot be *much*, if any, *progress* without it; *i. e.*, *love* for the *race*. This element gives a clear and wise mind, overcomes *great difficulties*, makes burdens light, and brings the hey-day of sunshine where damp and chilly darkness was.

Next comes Patience, a most valuable auxiliary to us, which is only secured by experience, and it may be by a bitter one. An idea may be conceived by one, and an attempt by another to put it into practice is made; but at the first trial, it will not have a success, because of difficulties that could not be foretold. Next comes loss of confidence, and an impatient spirit will take possession, and hence the failure. Our daily practice is a school; it is "line upon line and precept upon precept, here a little and there a little." What may not become familiar with us to-day, will be, with patience, to-morrow.

We are coming in these days to deem it of great importance, and I may say absolutely necessary, that those who now propose to enter our ranks shall attend to *more* than a clinical instruction; but that they shall attend schools of didactic instruction; that the foundation of their practice shall be laid upon principles which reach from the beginning to the end of their professional life. Would that those who have not received this teaching of principles, at the commencement of their practice, could see the *open door*, to now improve the opportunity.

But, if we cannot do what we *would*, let us do what we *can*. Set about teaching ourselves. We can, by far, better instruct each other by actual demonstration, in connection with our discussions, than by discussions alone. In my opinion, there is no way that we can advance ourselves so rapidly; and it is a kind of teaching in which all can take a part, from the one of the least experience to the one of the most. For instance, we have for our *next* discussion, the subject of cleaning teeth, *in its strictest sense*, and we appoint one of our members, who *is* in practice, allowing him to select his case, with power to appoint two *Assistants*. He appears at the Clinic, makes the necessary examination, and gives his opinion as to what the case requires to put it in a proper condition; and for his part of the clinic he proceeds to remove all the excess of foreign matter. Then let his assistant continue the case, by the use of such polishing material as he may see fit to direct, &c. And the same in a case of filling: One prepare for the operation and fill, one apply the rubber dam; and another finish the filling. In this way the

work is distributed, and an interest is secured of more than one actively engaged and a greater variety of instruction is given in the same amount of time; and the value of assistants is shown, and learned the necessity of, at the chair while the operation is in progress. And in this way we are *better* prepared to enter the Society meetings, and take an active part in the discussion of the subject, and will be, most certainly, much more interested to instruct and criticise.

Gentlemen, much more might be said suggestively; but fearing that I may have already wearied your patience and occupied your time, I leave the subject for your consideration, with the earnest hope that a labor movement will be inaugurated at once; and I trust *all* will feel that they have a *part* and lot in it. Some of our most valuable ideas have come from those who were just on the threshold of practice. So let us *all* work, and we shall be a *living* Society, known and read of many.

NOTE ON ARTICLE FROM LIONEL S. BEALE.

Published in No. 69 of the Dental Cosmos, entitled EPITHELIAL TEXTURES HARDENED WITH CALCAREOUS MATTER.—Medical Times & Gazette.

This discourse on dentinal tissues in the main is an interesting one, and contains important facts respecting dental histology; still there are points embodied requiring notice.

Mr. Huxly maintains, quoted in the above article, that enamel and dentine both are dermal tissues situated beneath basement membrane. Prof. Beale on the other hand, regards them as belonging to the epithelial system and thinks both are developed on the surface of basement membrane. Says, the tooth grows in a manner so like a horn and a hair, that it is difficult to believe that it is not closely related to those epidermic appendages, while there are not wanting instances in which an eminence covered with an epithelial texture seems to take the place of teeth. Hair and teeth are sometimes abnormally developed, and Mr. Darwin has remarked that the teeth of hairless dogs are deficient and that over hairy men have abnormal teeth. He speaks of germinal matter being imbedded in epithelium, being arranged in

two covered lines one within the other. Says, the slight interval between these covered lines corresponds to the line of junction between the dentine and enamel in the full formed tooth. Speaks of the enamel mass diverging outwards and the converging mass of dentine inwards.

He does not say whether or not these basement membranes themselves continue to move outwards and inwards before the advancing movement of germinal matter. He lays down the foundation of the germinal movement fully in accordance with my own views, but here he stops short of clearly defining the developmental process any farther than explaining the germinal march in opposite directions and the secondary process of calcification. He further describes the completion of the process mainly in accordance with microscopic evidence, with some few exceptions. He does not advance the idea of nerve fibrils in tubuli or any other fibrils, only speaks of soft matter as tubular occupancy. Says the tube of the prepared specimen results from the desiccation of the organic matter; does not assign any sentient function to this soft organic matter. He says: It is reasonable to suppose that the dentinal tubes are for the conveyance of nutrient fluid from the surface of the vascular pulp to the dentinal tissue, when tubes do not fulfil a similar office in ivory, which is a tissue very analogous to the dentine. He even doubts the nutritive function of the tubes in dentine are the obscured resemblance of this tissue to that of ivory, leaving us to infer that he does not believe in nutrition of ivory through the tubular structure. Here I must take issue and maintain that ivory even is nourished throughout its entire tubular structure, not only nourished, but from analogy I should favor the idea of tubular nerve fibrils and sensibility as well as nutrition. I cannot think as some do, in relation to non-vital nature of enamel even. I believe, and have good data for such belief, that this, the hardest of all known organic structures, receives nutrition and suffers waste, though in proportion to its density. It is certainly sound logic to suppose all parts of living organisms to possess the attributes of life either in a major, minor or intermediate degree, as all organisms are reared by life force, and it

is but reasonable to conclude that some portion of this force is retained to sustain intact all the variously endowed parts of all organisms. No sooner than any portion of an organism ceases to live, nature at once makes efforts to reject such portion. Any portion of enamel of a tooth when disconnected from dentine in a living tooth, in time becomes friable and crumbles away. This fact has been recognized by all observing dentists.

The cuticle of the skin, which is composed of desquamatory epithelia, is not entirely dead matter so long as it is in connection with the corium beneath, or the true skin. There are regions, as the soles of the feet and the palms of the hands, which are subject to friction and pressure, that thicken by epithelial accumulation, the outer portion of which becomes dead and falls off; still the inner layers next to the true skin are in vital connection with the basement membrane, the true life builder, and when the cuticle is removed by blistering a sore sensitive surface is exposed. So in somewhat similar manner, by removal of enamel a live sensitive surface is exposed that is the terminus of tubuli with their living occupants. He further says: Surely if the ivory of the elephant's tusk can be preserved without nutrient fluids being conveyed by nutrient tubes to every part of it, it is extremely probable that the dentine of other mammalian teeth is in like manner destitute of any special provision for its free irrigation in every part. Says, These tissues undergo little change, and such an extensive system of nutrient channels as has been supposed to exist would be useless. I am not going to make war on Creative Intelligence for putting such vast numbers of tubes in the dentine, and further believe that if they were not needed and were of no importance they certainly would not have been so contrived. I believe, unlike Beale in this particular as in all others, that nature's works are always well done and nothing done without aim and object of the first importance. Every part and point, even of least seeming importance, are one and all connecting links and cannot be dispensed with with impunity, Prof. Beale's opinion to the contrary notwithstanding. Hair, horn, finger and toe nails, and hoofs even, do not form exceptions to what I have stated above.

Prof. B. speaks of the vascular structure of pulps but does not mention the subject of nerves in connection, and says nothing concerning sensibility.

Prof. B., in speaking of the incisors of rodents, certainly has made an unpardonable blunder, as rodents have no incisor teeth at all. The two teeth in either jaw in some rodents and in the inferior in all, are canines under all circumstances; the incisors in these animals are undeveloped, there being sometimes faint rudiments of both incisors and corresponding maxilla. These teeth are the true representatives of tusks in other mammalia, as the pachyderm family.

These teeth, approximating, give the jaws a narrow elongated appearance. Rodents have canines and molars only, as they have no use for any others.

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Operative and Surgical Dentistry.

To Students.

ROOT FILLING.

After the appropriate treatment which a practitioner has employed for the preparation of the pulp cavity and root cavity for a tooth deprived of the important organs which they contained, it is then for him to decide how to best fill these cavities so as to subserve the health and permanence of the tooth.

This member has heretofore received its principal nourishment through the pulp ; in fact the crown has received nine-tenths of its nutrition from this source, while the roots have received pabulum from the pericementum as well as from the pulp vessels of the fangs. The dentos* of the whole organ must now be nourished by the vessels of the pericementum. It must be remem-

* Tooth substance.

bered that thousands of dentine canals open on the wall of the root canal, each filled with a soft fibre. The distal ends of these canals are continuous with the stellate cells of the cementum, and therefore contain more or less plasma of the blood for an indefinite time after the removal of the pulp.

Now what is the necessity of plugging a root canal? It is to shut out all fluids from that cavity, from whatever source.

Some persons seem to think that if the foramen of the root is perfectly closed, so as to effectually shut out fluids from that source, the great object is effected. I think this is the *least* of all sources from which fluids may enter. From every one of the thousands of dentinal canals more or less serum of the blood will enter unless their open mouths be closed.

There are no free fluids in the alveolus about the end of the root in health. If there should result congestion of the soft tissues on the exterior of the end of the root, then there might be exudation, and a portion of the fluid enter the apicial foramen, provided the latter were not thoroughly closed.

Serum, entering the canal, would, if left there, decompose, and the resulting gases irritate and inflame the dental tissues, terminating in suppurative pericementitis.

The *materials* used in plugging roots are various. Gold, os-artificiel, Hill's stopping, gutta-percha, and cotton have each their advocates in the profession.

I think the substance used should be as nearly indestructible as possible, and still be compatible with the dentos with which it is in contact. It should also have the property of adaptability.

Gold has a great degree of adaptability, and is also in most cases compatible. Its indestructibility is well assured. It is not always, however, compatible. Gold is an excellent conductor of heat. If the palatine root of a molar is plugged with gold, and the crown is so extensively decayed that a large mass of gold is exposed on the surface, the changes of temperature in the external plug are instantly communicated to the palatine plug. Continued changes predispose to congestion and inflammation of the pericementum. If the crown plug is well protected by dentos, then the objection does not lie, and nothing

better than pure gold can be placed in contact with radical dentine.

Os-Artificiel—Ox. Chlo. Zinc—is compatible in all cases. It has about the same capacity for conduction of heat as dentos itself. It is undoubtedly indestructible when placed beyond the influence of *external* agents. It has antiseptic qualities even, which render it valuable. It has escharotic qualities also which are beneficial. Its adaptability depends on circumstances; in some cases it would not be as great as gold, but in others greater. By adaptability I mean the facility with which it can be carried to the apicial portion of the canal.

Hill's stopping is compatible, is indestructible, and has considerable adaptability. It has not the latter quality to the extent of gold or os-artificiel.

Cotton is compatible, but not indestructible; neither has it so much adaptability as gold or oxy-chloride.

That cotton has been taken from a root canal years after it was placed there, and found to have remained uncontaminated by noxious gases, is not sufficient proof of its fitness for plugging roots. In great numbers of instances cotton has been removed from roots which had an insufferable stench; and its failure to exclude fluids and gases from the canal was undoubtedly the cause of the disease and consequent loss of the tooth.

From my own experience and that of others, I believe gold and os-artificiel the two best materials that we now have for root filling. They may each be used alone, or in combination.

I will now describe my mode of using these two materials:

Cavity of decay is mesial surface of left upper central incisor. Make a *free* opening from cavity of decay to root canal, rounding off the angles. The root canal is not to be enlarged or meddled with by altering its shape. Its *naturally smooth* sides afford the best facilities for the passage of material to the apex. The long axis of the canal is not continuous in a straight line with the orifice of the cavity of decay, therefore flexible instruments are necessary for the *operation.*

Take a strip of whalebone and cut it down until you have the shaft of a delicate and tapering plugger, about two inches long

and of a diameter which will easily enable it to pass to the end of the canal. Mark on this plugger the length of the canal. The patient wishes gold in the root, and there is not the least objection to its use.

Take a leaf of *unadhesive* foil, the less adhesive the better, and make pellets of about the sixtieth of a grain. Let them be spindle-shaped, or cone-shaped, and tolerably hard, so that they can easily be carried before a plugger. The first ones used should be of the smallest size.

Place one in the canal and gently carry it forward with the flexible plugger, being careful not to pierce it with the latter. Condense this pellet as much as possible before introducing another. You can tell when it is carried to the apicial end of the canal by the *mark* which you have made on the plugger. If a *steel* instrument can be carried as far as the whalebone one, it should be used in preference, as condensation will probably be increased. I find no difficulty, however, in condensing small portions of gold sufficiently with the whalebone plugger.

When the canal is nearly full, and steel instruments employed, annealed or adhesive foil should be used to finish with, for the purpose of perfectly uniting the crown plug with it. If the latter is not considered important, then continue the use of soft gold.

Now let us suppose that the same canal is to be plugged with os-artificiel. Carry a pellet of soft gold to the apex of root and condense well. Mark on the plugger the depth of the canal remaining.

Now we are going to *leave* a portion of this whalebone plugger in the root; a piece long enough to reach from the condensed gold pellet to a point in the canal which we wish to be occupied by the commencement of the gold crown plug; therefore cut the whalebone around, so as to nearly separate it, at a corresponding point.

Mix osteoplastic to a thick creamy consistence, place some *immediately* in the canal and press it onward with the bone plugger until the cavity seems full. Withdraw the plugger; cut it off at the place before indicated, and press the cut-off piece home in the root. The object in leaving the bone there is to

force the osteoplastic against the sides of the root and leave it undisturbed. The whalebone is as innocuous then as the "os."

Gold wire, instead of whalebone, may be used in connection with osteoplastic if desired. I have used it thus, without the gold pellet at the end.

Let the wire be of chemically *pure* gold, so as to be soft, and it can thus be adapted to crooked canals.

For the buccal roots of molars, which have very small canals, I use very fine gold wire which is stiff and elastic. The surface of the wire should be roughened with the file so that the osteoplastic will better adhere to it. To be sure about carrying the "os" into these minute canals there should be an abundance about their orifices, and it should be churned up into the canals before leaving the wire there. There is no danger of carrying it through the apicial foramen in a perfected root.

Fibres split from whalebone will answer often in place of gold wire for these small canals.

The student should commence his filling *out* of the mouth, trying various methods. He should then file or grind down an outer surface of the fangs until he comes to the canal, and thus examine every portion of its length, whereby he will be enabled to judge of the success of the operation.

It will of course be understood that root filling *in* the mouth is usually more difficult than *out* of it.

Osteoplastic has a slightly escharotic action on dental tissues. It will destroy the vitality of a thin section of dentine. Its action would probably not extend beyond twice the thickness of writing paper. It coagulates the soft tissue which it touches. We know its effect on a slightly exposed pulp. Therefore, if the question is asked, if the escharotic effect on the open canals of radical dentine will injure that tissue, we may answer *no*, both from theory and experience.

It might also be asked if the porosity of osteoplastic would not allow the absorption of blood serum from the dentine canals. I have found that a lump of oxychloride of zinc did not increase in weight a particle when left in water twelve hours. The pellet had been made a month before the trial. CHASE.

HEAVY FOIL.

The latest novelty, in dental science, attracting much notice, is the use of heavy foil. Foils ranging from 20 to 120 grains to the sheet. The credit of introducing this new sensation, is due, so far as we have been able to learn, to Dr. W. H. Atkinson, of New York. It was brought to our notice by Dr. H. J. McKellops of this city. Dr. Mc., while on a visit to New York the past summer, called upon Dr. A. who, with his usual urbanity and politeness, invited his friend to witness the operation of filling teeth with the heavy foils, Nos. 15, 20, 30. Dr. Mc. reports himself as very much surprised at the apparent ease with which the Dr. manipulated them in all classes of cavities, and at the fine results produced. So well pleased was he with what he saw, that immediately on his return home, he commenced the use of heavy foil in his own practice. The attention of ourself, and other members of the profession, in the city, was called to it by Dr. Mc., who invited us to witness the operation of filling with the heavy Nos., 20, 30, 60. The result has been the general—I might say the exclusive adoption of them by all who have given them a fair trial. Prof. Judd is using No. 120, in some special cases, and speaks of it in the highest terms, but thinks Nos. 20 and 30 will be most generally used; uses 120 on large flat surfaces.

Having adopted the use of them ourself, to the exclusion of all the lower Nos., and being daily better pleased with the results, and most fully satisfied that it is the best form of gold for filling extant, we ask the attention of our readers to a few facts respecting heavy foils:

Whew! says one, what a piece of nonsense. You are certainly not going to ask the profession to adopt this new folly because Drs. A. and B. see fit to recommend it. Why, the ink is hardly dry on your letter recommending the extreme low Nos., 2 and 3, for the same advantages now claimed for Nos. 20, 30, 60. What inconsistency! Do you suppose the profession will accept and adopt, as new and practical, a form of gold, which was tried long years ago, by one of the best operators in the profession, Dr.

Arthur, and given up as impracticable. Because *some men* stir the broth must we drink it? Now, dear reader, what matters it who does the stirring if the broth be drinkable? If we are not able to do the stirring, don't let us deny others the privilege, or refuse to drink because we had no hand in the making. Having tasted this last bowl of broth, we are prepared to recommend it; we know its components and the principle upon which it is concocted; we know it to be savory, and believe it to be a promoter of health. We are willing to acknowledge it does look a little inconsistent, after what has been said in favor of No. 2. Still we think, a pretty strong case can be made for No. 60. I am also aware that Dr. Arthur tried heavy foil, but I am not disposed to allow that the foil he used possessed the same qualities as that we now have. Neither was his mode of manipulation the same as we now propose.

We adopted the use of No. 2, and recommended it for its apparent softness, adhesiveness, and for the ease with which it was manipulated; we say apparent, because we now believe it does not possess in fact, these properties in excess, only in appearance. Being so extremely thin it offered but little resistance to the instrument, and the particles were so easily driven together, and so firmly held by the mechanical process of interlocking that we were led to believe it possessed all the requisites of a perfect filling. If we but study the properties of this metal, gold, and note some of the laws governing it, we may be able to account for some of the advantages claimed for No. 60. Pure gold is a soft malleable ductile, tenacious metal, crystalline or cellular in structure; specific gravity 19.2, which may be increased to 19.6+ by lamination. It possesses the peculiar property of adhesiveness, or cold welding. By lamination the malleability, ductility and tenacity, as well as, density is increased to a limited degree, while it is rendered less soft, and the cold welding property is perceptibly diminished.

A trace of iron, copper, or silver, as an alloy, makes it harder, and perceptibly lessens its adhesive property, while the other properties mentioned are increased. The molecular condition of the surfaces, as well as of the mass, effect the adhesiveness. Foil

when taken from the cutch is hard, elastic and non-adhesive. Change its molecular condition by annealing, and it becomes non-elastic and adhesive, dependent upon the degree of heat to which it is subjected. Foil subjected to the action of certain gases, as sulphuretted hydrogen and phosphoric acid, at once loses its adhesive property, while ammoniacal gas works another change, rendering it more soft and velvety. We have at the present time several forms of this metal, in which it is used for the purposes of filling teeth, viz : sponge or crystal and fibrous gold, (all similar in character). Non adhesive soft foils, ranging in Nos. from 4 to 10 grs. to the sheet, adhesive foil in Nos. from 2 to 6, and last, but not least, adhesive foils in Nos. from 20 to 120. If we compare these different forms with one which shall possess all the requisites of a perfect filling, being aided in our comparison by the known properties and laws governing the metal, we may place a very fair estimate on the comparative value of each. For instance, with the present mode of manipulating a filling by mallet pressure, the gold should be soft, tenacious, adhesive ; readily adapted to the walls of the cavity, and capable of being rendered uniformly solid, without the expenditure of too much time or labor. If we compare sponge or crystal gold by this standard, we find it soft as desirable, but wanting in tenacity. It is readily adapted to the walls of the cavity, but it requires too much time and labor to thoroughly condense it and to secure perfect margins. Non-adhesive foil is sufficiently soft and tenacious, and is quite readily adapted to the walls, but lacking the adhesive property it is not so well adapted to the present mode of manipulation, and to all classes of cases, as sponge or crystal gold. Adhesive foils, Nos. 2 to 6, are harder than the sponge gold or the soft non-adhesive foils, harder also than the heavy Nos. of adhesive foil. The extreme attenuation of Nos. 2 and 3 makes them less tenacious and adhesive than the heavy Nos.. Being hard and somewhat elastic, they are not so easily adapted to the walls as the non-adhesive foils, and more time and care is required to properly condense them. Being exceedingly thin, and wanting in tenacity, they are easily broken and torn into small fragments or scales, which are not sufficiently

adherent to stick to the face of a plug, and consequently break way in a short time, and are washed away by the fluids of the mouth; hence we find the surface of a large majority of the plugs made with these low Nos. presenting a rough unfinished appearance, full of minute pits from the serrations of the plugger.

Adhesive foil Nos. 20 to 60 and upward, approaches more nearly the sponge or crystal form in softness, because in the process of annealing it is brought back to nearly the same molecular condition. It also regains the property of adhesiveness to a much greater degree than the low Nos. Having been rendered fibrous by lamination it excels the sponge or crystal in tenacity, and is therefore superior to these forms in that respect. It does not break up or crumble under the instrument as these forms are apt to do. If properly manipulated it is readily adapted to the walls of the cavity, and with the same expenditure of time and care it may be more thoroughly condensed, and better margins can be secured than with any other form; being soft, non-elastic, tenacious, and adhesive, it may be carried over the edge of a frail wall without crumbling the wall in the least, its thickness preventing injury to the border or wall of the cavity by the sharp points of the plugger being driven through it, a difficulty attending the use of crystal gold, and the extreme low numbers of foil. Its extreme adhesiveness admits of the use of very fine serrations on the point of the plugger, hence the surface of the plug presents a more solid and uniform appearance; being very tenacious it makes a more lasting surface, because the foil is not broken or torn by the instrument in condensing, as has been observed is the case with the low Nos. and with crystal and sponge gold.

We have thus briefly endeavored to give our readers some of the principal reasons for our adopting this new hobby of Dr. A's., and we feel assured of receiving their thanks for thus calling attention to it, if they will but give it a fair trial. Our mode of manipulating the heavy foil may be the subject of another article. E.

PREPARATION OF CAVITIES.

Case I. UNDER MOLAR very concave on grinding surface, having a cavity at the bottom of concavity. Opening through enamel small, but decay extends under it for a sixteenth of an inch each way from the opening. Enamel is now cut away to the extent of the diseased dentine. A dozen ravines and a dozen ridges from the surface of the enamel on the grinding surface of this tooth. These ravines and ridges commence near the outer borders of the grinding surface of the tooth, and run towards and terminate in its centre. The ravines are *not* fissures, they do not extend below the surface of the enamel.

How shall this tooth be prepared for filling? As it now is, a plug would present a festooned appearance around its entire margin, when finished, and would give a great deal of trouble to *finish* so as to make a respectable *looking* plug. To protect the cut edges of the enamel we are obliged to have the gold extend *higher* on the ridges than in the ravines. Do the best we can the margin of the plug must present an irregular or festooned appearance, which is not pleasant to the eyes.

I have found these ridges to be, invariably, surplus enamel; that is to say, if the ridges were removed, the enamel would be just as thick under the surfaces occupied by them, as it is under the ravines. Therefore I propose to dress these ridges down to a level with ravines, near the margin of the cavity, *before* introducing the gold. The enamel may be removed by chisels and burrs, and *thoroughly polished.* Now we have a smooth and continuous margin, which will receive the gold kindly, and enable the operator to make a perfect and handsomely finished plug.

Case II. Ridges and *crevices* instead of ravines, with a small cavity in the centre, not occupying more than one-eighth of the diameter of crown. Crevices shallow, but decayed, and extending from centre to nearly the periphery of crown.

Operation. Level the ridges; cut out the crevices, but not cutting out the sound dentos between the crevices. Form a margin for an artificial cavity by cutting a shallow groove from

the peripheral end of one crevice to the peripheral end of its fellow, and so on all the way around the coronal surface.

We have now a sort of tunnel-shaped cavity, having but little depth at its margins, but very great depth in the centre. We will anchor our plug *fast* in the centre and then gradually fill up the whole cavity to its margins.

If the surface of the plug is made of No. 60 gold, or even No. 120, we can get firmer and more durable margins than by the use of the *low* numbers.

Such a cavity as described is particularly suitable for the heaviest Nos. of foil.

By the way, there is great *fascination* in the use of the heavy foils. I find myself disinclined to take up anything less than No. 20 now, even for *frail* cavities. By using it in strips one-eighth, or one-sixteenth of an inch wide, it can be *carried* and consolidated whenever the thinner leaves of gold can be. Furthermore, there is no comparison between them for adhesiveness; No. 20 being very far in advance of No. 2 in this respect. I find that I can *finish* a plug in half the time the surface of which is formed of No. 60 foil; it dresses down like solid coin.

CHASE.

SAVING THE PULP ALIVE.

It is the general practice among the best class of Dental Practitioners, in St. Louis, to endeavor to save the pulp alive. The success which has attended efforts of this kind, by myself and friends, is very gratifying, and warrants continued practice in this direction. It is, of course, impossible to state the percentage of perfect cures, but it is so great that the bad cases are so much in the minority that they are soon forgotten.

The most usual form of treatment is still to cap with osteoplastic, after subduing the previous inflammation, with creosote. The osteo should be mixed with as little of the acid as possible, and still have it of a creamy consistence. The cavity should be thoroughly dried, and the tooth protected from moisture for ten

minutes. Small smooth instruments, made of *wood*, are better than those of iron or steel for manipulating the osteo. Press the osteo home with small balls of bibulous paper, which will absorb the superfluous acid. Pain, more or less severe, may ensue, and last an hour or two. If it should be very severe, the tooth should be tried with cold water in two or three days, to ascertain whether the pulp is alive or not.

In those cases when a portion of the pulp has been removed, either with an instrument or by the suppurative process, it would be better to entirely fill the cavity of decay with the osteo, and use the latter as a *trial* plug for a few weeks or months. In cases of *immediate* exposure of the horns of the pulp while operating, there is very little risk in the immediate insertion of a gold plug over the osteo *cap*.

SAVING THE PULP ALIVE, is now an established operation, and one I think which will not soon become unfashionable.

CHASE.

SENSITIVE DENTINE.

About three years ago I recommended sulphate of morphia for the above condition.

I had a patient, lately, whose teeth were all exquisitely tender to the touch of an excavator. I tried chloride of zinc without success. The cavities to be immediately plugged were then filled with sulphate of morphia and cotton, and allowed to remain thus for an hour. The effect was very gratifying, for I was then enabled to excavate thoroughly and rapidly without pain. Eight cavities were successively treated in this manner. Patients should not be sent from the office with the morphia in their teeth. It might be dislocated and swallowed. It must remain in some teeth a full hour to derive full benefit from its narcotic power. Morphine has entirely failed me at times. No dependence can be placed on any one remedy for all cases. But I heartily recommend morphia for *trial*. CHASE.

Mechanical and Miscellaneous Department.

(*Editorial.*)

THE NEW YEAR.

Shall we greet our readers in this first issue of the New Year with the hackneyed: Happy New Year! which has become hoary with age without having become venerable—a phrase which is dealt out by all classes, too often without a thought of what the words mean,—which is extended as heartily by many to those to whom they really wish anything but happiness, as to their most intimate friends? Or, shall we give to our readers, in this New Year's issue, a greeting which wells up from the heart, and which shall not be a mere conventional one.

Inasmuch as we have now been, for nearly a quarter of a century, upon terms of intimacy and in daily communication with Medical and Dental practitioners, by whom we have almost invariably been treated with the greatest kindness, it is not strange that we should feel like greeting our professional brethren with something more than the commonplace expressions, which, from their very frequency, have become meaningless. We feel not only an interest in the well being of our readers, among whom we are proud to claim many friends, but we are ready to contribute our mite, and to labor with what little energy and power we can command, to clear away some of the obstructions that impede the progress of us all; to light up the dark places, that, with a clear view, we may more surely and more quickly reach that goal of professional excellence to which a rigid culture, extended literary acquirements, and high scientific attainments, can alone carry us.

To simply wish our professional brethren happiness and prosperity, is but a cheap return for the many favors which we have all received from the profession, and it is meet that we should

endeavor to pay the debt in kind,—that we, in as much as we have received much from the labors of our fathers, shall, at least, leave to our children an inheritance that shall be no less valuable.

Many of us have often resolved, that at some time, in the not far distant future, we would commence our investigation of scientific subjects, and win for ourselves a reputation and a name that should be borne along down the tide of time, upon the historic page, among the honored names of benefactors of the race. But resolutions of this kind are seldom kept, and years glide along, until suddenly we are aroused to a consciousness of the fact, that we have not only wasted the best part of a life, that might have been a far more useful one, but that the shadows of age are already falling around us, and after a few more years of fruitless regrets for the past, the grave will have closed over this mortal form, and no trace will ever more be seen rippling the smooth tide of time, to tell in the coming ages of its former existence.

Let us not then begin the year with only common-place wishes for the welfare and happiness of our friends, and the profession at large, but let us at once begin a work that shall extend through life, and do something ourselves to benefit the profession, to elevate its standard, to correct its theories, and improve its practice, and thus show by our works that our "Happy New Year greeting" to the brethren of our profession is something more than a meaningless conventional expression. J.

ADAMANTINE PLATES.

Under this head we propose to speak of plates formed of either of the metals which are placed in the market by Walker, Weston, or Moffatt, and which do not differ materially from each other.

Moffatt's melting at a slightly higher heat than the others, and Weston's resisting the action of acids perhaps a little better than the others, and either of them resisting the action of the oral secretions much better than silver.

To get a perfectly correct view of this question we must con-

sider that they are proposed for cheap work, and if any one supposes that any kind of cheap work is equal in all respects to gold or platinum, he is greatly mistaken. But as long as cheap work is to be done, it is an object to know exactly what advantages and disadvantages each one has, and from a consideration of them all to determine which is the most suitable for the purposes desired.

We shall indulge in no fine-spun theories upon these subjects, which are so intimately connected with the every day practice of our readers, and shall not recommend, for general use, anything farther than experience shall warrant. This rule is far too often disregarded, and especially is this so in regard to excerpts from one Journal to another, which go the rounds of the Journals without any regard to their reliability, and frequently lead to disappointment. Such a case has already been noticed in a former No. of this Journal, when quicksilver was recommended to be placed upon an amalgam filling, which it was stated would soon soften the amalgam so that it could be easily removed. Experiment showed that an amalgam plug could lie for weeks in quicksilver without having materially softened. Another case in point is an extract from the *Druggists' Circular*, which has been traveling the rounds of the Medical and Dental Journals lately in regard to the mixing of pulverized althea root with plaster of Paris, when it was stated that it would become so hard when it had set that it might be filed and polished like marble. This would be very desirable in many cases, and we should have been glad to have laid so valuable a discovery before our readers, but thought it best to test it before giving credence to it, and upon testing it in various ways it was found perfectly worthless for all purposes so far as increasing the hardness of the plaster was concerned; and upon relating the result of our experiment to the Editor of the Mechanical Department, he informed us that he had likewise just been testing the matter himself with the same result.

So in regard to the use of these various bases for artificial teeth we shall not be led off into any extravagances upon this subject. Nor will anything we have to say be tempered in the least

by the interests of manufacturers or inventors, but we shall merely give the results of actual experiments. I have taken some pains to determine, experimentally, whether these bases are affected with acids or not and to what extent. I find that nitric acid acts upon all of them nearly alike, that sulphuric and muriatic act upon them much less, the muriatic acting more than the sulphuric. These results are what might be expected, and it is perfectly useless for the friends of these bases to attempt to deny it. These acids also act upon vulcanized rubber, the nitric acid particularly dissolves vulcanized rubber rapidly. So in our search after cheap bases, we have not yet found any available material that will resist entirely the action of the acids. Aluminum is acted upon much less by the acids than the adamantine bases.

But a more practical question is, What action is produced by the secretions of the mouth upon these bases?

We know that upon rubber plates the fine polish upon the surface soon disappears, in some mouths, however, much sooner than in others, and this is proportioned to the degree of acidity in the secretions of the mouth. This is a disintegration of the plate, and in many mouths the plate becomes exceedingly filthy, soaked with the secretions of the mouth, and upon breaking up the plate the olfactories will at once testify to the truth of this proposition.

The adamantine bases are acted upon by the secretions of the mouth to a certain extent, and, as a matter of course, in some mouths more than in others, as is the case with rubber, but the action of these juices of the mouth in many cases is scarcely perceptible, and I have seen these plates after several weeks use presenting almost as bright a surface as when placed in the mouth, and I have seen no case, as yet, where the change in the surface of the plate was much more than we sometimes find upon gold plates soldered with solder that is not very fine, worn in mouths with vitiated secretions. In fact, these bases withstand the actions of the oral secretions much better than one would, â priori, expect. So far as cleanliness is concerned they are superior to rubber.

Next, how do they conform with rubber as to strength? In

cases of partial plates, and especially where there are teeth standing alone, and where they are required to be very short, the adamantine bases furnish a much better attachment to the teeth than the rubber. The rubber is lighter than the adamantine, and in this respect has the advantage.

It has been contended by some that the extra weight of the adamantine, or of Allen's platinum base is no objection, but we do not so consider it, though with this slight defect Allen's continuous gum work on platinum base is certainly in many places the nearest approach to perfection that has yet been attained.

This extra weight in adamantine is, therefore, a defect, but it can be much lessened by taking care to leave no considerable spaces between the heels of the teeth and the plate to be filled up by the metal, and by making the plate as thin as a proper regard for its strength will admit.

When these points are properly observed the plate will be but little if any heavier than a gold plate.

Next, as to the expense of the material used, this is slightly in favor of the rubber, but in a partial plate of five or six teeth the difference in expense will not be more than 25 cents, and it is not probable that that difference even will always exist.

The amount of labor required in the construction of the two kinds of work, i. e., Rubber and Adamantine, does not materially differ, though it is perhaps desirable to take more time to dry perfectly the plate in the flask to insure a good result in casting the adamantine, than it would take to vulcanize a rubber plate, but as this drying process requires no attention, the flask being simply placed upon a stove, or in the oven of a stove, it can scarcely be charged to the account of work required when making up a statement of the amount of labor required for constructing a plate of this kind.

It is probable that one who has been accustomed to manipulating rubber, when he first begins to work these bases, will for some time have much more difficulty in working them than he will in working rubber, but familiarity with the details will remove one after another of the difficulties, and we think the final verdict will be that they can be put up as easily as rubber.

There are some other considerations that are in favor of the adamantine bases. A case will illustrate this more clearly than any other method that we can adopt.

A plate was placed in the mouth a few days since with the superior first bicuspids and the central incisors attached to it. Through some mistake the centrals did not fit as closely to the gums as they should, and their cutting edges were slightly too far out to make the arch complete, or indeed to correspond with the laterals in the mouth.

Such mistakes as this will not, of course, often occur, but this will suffice to suggest how plates may be mended when broken, and how teeth may be replaced when broken off from a plate, or, indeed, how new teeth may be attached to a plate that has been worn in the mouth; that portion of the plate having the incisors attached to it was sawed off a quarter of an inch from the teeth, the piece of plate attached to the teeeh filed off to let the teeth back sufficiently when placed in the mouth.

The plate and teeth were then placed in the mouth and adjusted precisely as they should be when completed, and held in their relative positions by wax. The whole being removed from the mouth, plaster was cast upon the palatine surface of the plate, covering also the teeth. As soon as the plaster had set the whole was laid, for a few minutes, upon a hot stove. Then the cut edges of the plate were moistened by a strong solution of chloride of zinc. A small portion of the solder, which accompanies the adamantine base, was placed over the line of division, and with a soldering iron heated pretty hot; the solder and a portion of the plate itself was easily melted and readily united the two pieces together, to all appearances as strong as ever. The whole operation occupying about 30 minutes.

We think, as a general thing, a better method of holding the two parts of the plate in such cases in their relative positions is by placing plaster over the lingual surfaces of the plate and retaining it in position with the fingers until it sets, and then, if the mass of the plaster be tolerably thick, should the two pieces separate whilst removing them from the mouth, the fracture in

the plaster will suffice to enable the pieces to be placed together again in their exact relative position.

But we have heard of those whose patients complain that adamantine plates have a bad taste in the mouth. We have had patients complain of the bad taste of gold plates, 20 carats fine, of platinum plates, of rubber plates, of silver plates, and about as often of one as of the other.

Perhaps the gustatory nerves are unusually developed in these cases, or perhaps the imagination is the sole excitor of the gustatory apparatus, or it is possible there is a slight difference in the composition of the three bases that may account for it. Nearly all the metal used in this place and vicinity being Weston's, and concerning which we have not yet heard any of those complaints, but as gold and silver are not exempt from these real or supposed faults, we presume Weston's metal will also be charged with the same defects.

In regard to the working of these metals into plates, we will only say that any one who can put up a rubber plate can very readily put up one of these. A flask adapted to this kind of work will facilitate the working of these metals, and a small ladle will complete the armamentum required. We will note a few of the requisites for success:

Take your impression as in any other case. Mix with your plaster $\frac{1}{4}$ or $\frac{1}{3}$ of its volume of fine sand, or what is perhaps rather better, fine marble dust. Before pouring your mixture of plaster and sand into your impression, cut out of the impression a cavity, such as you desire in your plate, for a suction cavity. Grind the teeth and adjust them as for rubber. Make the trial plate of wax or gutta-percha, or what is better, about three thicknesses of tin foil, and dress down the trial plate carefully, if of the former material, to as near the thickness desired for the plate as possible. Dry perfectly, and just before pouring the metal heat the flask pretty hot, nearly up to the point that is required to melt the metal. A little experience will alone regulate this matter. The plate should be two or three times as thick as a gold plate, and it can be much strengthened by casting the margins somewhat thicker than the body of the plate.

These plates, though far from being everything that is desirable, are much better, all things considered, than rubber plates. They are not patented.

We confess that these details will have but little interest for those who have a class of patients, such as may be found in all the larger cities, who are able to pay for gold or platinum work, and who have no use for cheap bases, but we hope that that class, which constitutes by far the largest number of practitioners, who are obliged from their location and surrounding circumstances, to supply the poorer classes with artificial teeth, will be instructed and benefited by a perusal of this article.

We intend to recur again and again to these practical subjects which are now agitating the Dental fraternity, and to give the results of experiment from time to time, as facts accumulate. We consider this the true sphere of a Dental Journal. Two other subjects of great importance, which alike will interest all classes of practitioners, i. e., the use of heavy foils, and the preservation of exposed pulps, will receive their due mead of attention. Other kinds of plate will be considered in the next No. of the Journal. J.

(*Continued from Vol. I., Page* 565.)

ST. LOUIS MICROSCOPICAL SOCIETY.

OCTOBER 27.—Society met at 7½ P. M.

Drs. Wm. S. Edgar and G. W. Bowman were elected members.

Dr. Judd reported that the case of epithelioma reported at the last meeting was still extending down the throat and had now attacked the vocal chords.

Dr. Spinzig exhibited specimens and drawings of several tumors and a round-celled sarcoma, and one he would call a chondroid sarcoma. The latter specimen was taken from the uterus by Dr. Gregory.

The Doctor extended his remarks to considerable length upon these varieties of tumors, after which society adjourned.

NOVEMBER 10.—Society met at 7½ P. M. Minutes read and approved.

Dr. Gill reported in relation to the case that he reported at the August meeting that he had seen the case again. The dark purple color has extended to the cheeks, forehead, and some other parts externally, and now involves the gums above and below, which are much swollen and softened. The lower canine teeth are loosened, the voice reduced to a whisper, and the respiration very considerably obstructed. The cheeks are much swollen but not painful, in fact the patient is suffering very little. The disease has extended rapidly since he was seen two months since.

Dr. Hammond showed some crystals of chlorate of potassa and nitric acid by polarized light.

Dr. Hammond exhibited a drawing of pus corpuscles magnified a little more than six hundred diameters, and the same after the addition of acetic acid, the case showing the necessity of making a microscopic examination of this fluid, as he had examined the urine chemically, employing the most delicate test for albumen, it being present in the liquor puris (as it always is); but in this case (and such cases are common) there was not enough pus present to give the chemical test for albumen. The microscope readily revealed the presence of pus corpuscles in the urine, which would have been considered normal. In this case the urine was acid, which would not lead one to suspect pus, as purulent urine is so frequently alkaline and ammoniacal on passing, or soon becomes so. In this case I had not enough of the urine to take its specific gravity, nor did I determine the amount of urea it contained, a thing that I consider so important in some cases of renal disease.

Dr. Hammond also exhibited some drawings of pus corpuscles and milk, taken from a diseased breast that had come under his observation; also a drawing taken from the milk of the healthy breast of the same woman.

There was an open abscess five-eighths of an inch above and external to the nipple. Taking a little of the discharge from this and putting it under the microscope, it was found to consist of a mixture of pus and milk. An inch and a half above and external to the nipple, the breast was soft, so that an opening would have been made by nature in a short time. This place

was lanced, and examining a little of the discharge from it, it also was found to consist of a mixture of milk and pus. In this drawing, made by the aid of the camera lucida, we have the pus corpuscles and oil globules magnified about three hundred and eighty diameters.

A drop of milk was taken from the nipple of the diseased breast, and a drop from the nipple of the sound breast, and both examined under the microscope. In the drawing made from the sound breast the oil globules are very numerous. In that taken from the nipple of the diseased breast they are not numerous. I have tried to make a rough estimate and I think there are fifteen or twenty oil globules in the secretion taken from the nipple of the sound breast to one in that taken from the nipple of the diseased breast.

Dr. Hammond asked if pus corpuscles were ever found coming from the nipple with the milk. As some of the oil globules were as large or larger than the pus corpuscles, he saw no reason why pus corpuscles should not pass.

Dr. Gill said he thought the abscess arose from obstruction of some of the lactiferous tubes, and therefore he should not expect to find pus corpuscles coming from the nipple.

T. H. Hammond, M.D., *Rec. Sec.*

THE HARDMAN COMPOUND.

Editors Missouri Dental Journal:—To fulfil a promise I have made to several of your readers, who have written to me and asking "what the compound is that I use in joining artificial teeth to aluminum or other plate?" I will, at your leave, cheerfully, and as briefly and plainly as I can, state what it is and how I proceed.

First, then, the Hardman compound consists of

Tin,	9 parts
Bismuth,	1 "

Melt the tin and add the bismuth.

This compound melts at a much lower heat than tin, and being

much harder will receive and retain a much better polish; runs sharp, and is about as pleasant in the mouth as gold.

2d. We will illustrate upon a full upper set. The model is made in reference to moulding in sand, and the plate is struck in the usual way laid down by Harris and other authors. Arrange the teeth (those intended for rubber with headed pins) upon this plate, and at this stage try in the mouth, and see that all is right. Place wax (not in superabundance) wherever the compound is desired.

If we have nothing better, file two notches in the edges of the two halves of a vulcanizing flask opposite to the heels of the palatine plate, and so that when the parts of the flask are brought together these notches will form holes about $\frac{1}{4}$ of an inch in diameter.

3d. Oil the plate and wax surfaces, and after filling the palatine side of the plate and the base half of the flask with a batter of equal parts of plaster and sand, place the plate with the teeth edge up in this, with the heels directed towards the filed notches. When hard trim the plaster—varnish it, and oil it and the wax. Place on the other half of the flask, and fill up with batter of plaster and sand. After it is sufficiently warm separate the flask and remove all the wax. Cut grooves from each heel to the notches for gates to pour in the melted alloy. Remove the plate—cleanse it, and drill eight to a dozen holes, one half line in diameter, in the plate immediately under the blocks, and here and there around the labial border of the plate where the metal is intended to run; counter-sink these upon the palatine side of the plate.

Or, instead of these scattered holes, pairs of holes, about two lines apart, may be made under each block, and with a blunt flat punch as thick as the diameter of the holes, and as wide as the holes are apart, the intervening space between the holes (over a piece of lead) sufficiently deep from the palatine side to form a staple of the metal when it is run upon it. While this is being done the two parts of the flasks, separated, may be placed in an oven, or other convenient place, and heated sufficiently to dry out well the moisture.

4th. Replace the plate upon the model, see that all is clean,

bring the parts of the flask firmly together, put it back into the oven and heat up to the melting point (or a little more) of the compound, which have also melted in a ladle. When all is sufficiently hot place in position and pour the melted compound into one of the gate holes until it runs over into the other. Cool gradually and remove. Finish with files, scrapers, emery paper, &c., &c., as we would rubber.

With teeth mounted on aluminum base plate, by this plan, a very light and strong piece can be made, that will be easily kept clean, will remain pure in the mouth, and do no abnormal mischief to the tissues of the mouth or its associated parts.

Where much reduction of the alveolar ridge exists, and lips are long, care must be had or too much weight will prevail. To avoid this use aluminum and long teeth, which will require but little of the connecting metal.

For under dentures, where considerable weight is desired, this metal is used (without any other plate) on the "cheoplastic" plan. In this form the model is made thin and of equal parts of plaster and sand.

5th. From a change in the form of the alveolar ridge, or from other causes, it often becomes desirable to remodel from a renewed impression.

To do this a thin model is made of plaster and sand, and but thinly varnished. After the modeling is done place the set of teeth upon this model, and wax all around the edge, so as to prevent any plaster from flowing under the plate. Place in the flask, and when hard, warm, separate and remove the wax. Place the half with the teeth in a ladle and heat sufficiently to melt out the metal compound from the plate and teeth. Now restrike the plate and replace it into the flask, upon the model, and proceed as for new job.

6th. The repair of this variety of work is readily done.

We will suppose a front incisor fractured of an upper set. Proceed by breaking away the old section entire. File sufficient of the metal away to give room to adjust another section, which retain in place with a little wax cement. Place the whole in an investment of plaster and sand. When hard remove the wax

cement, cleanse the pins, &c., well. Dry the batch with care not to melt the connecting metal. Now saturate with muriate of zinc (zinc dissolved in muriatic acid) the surface of the metal where the block sits, and also the pins. Place the gold foil, moist with the zinc, loosely about the pins and against the porcelain block where it is desired the metal should flow. Then place enough clean pieces of the metal saturated with the zinc against the foil and with the blowpipe direct heat from a spirit lamp, and the work is readily done. J. HARDMAN.

Muscatine, Dec. 27, 1869.

MISSOURI VALLEY DENTAL SOCIETY.

Reported for the Missouri Dental Journal by J. F. SANBORN.

The Missouri Valley Dental Society met in the office of Drs. Thomas & Chadduck, Nebraska City, Neb., on Tuesday and Wednesday, January 11th and 12th, 1870. The President, Dr. E. J. Woodbury, of Council Bluffs, in the Chair.

After the reading of the minutes the President opened the regular business of the session, in an address on the treatment of exposed nerves, which was full of practical information.

Dr. Sanborn addressed the Society on extracting teeth for patients of hæmorrhagic diathesis; giving the treatment in anticipation as well as subsequent to the operation.

Dr. Thomas presented a patient he had operated on for irregularity of teeth, and explained his mode of treatment.

These, as well as other subjects, were thoroughly discussed.

There was an essay read on "Vital Phenomena," which contained some ideas so out of the ordinary channel of thought, that it called out considerable discussion.

The 2nd day was spent in Clinic; "Mallet Contour" fillings being the order of the day. Dr. Thomas operated.

It is with pleasure we inform our Eastern professional brethren that our clinic would compare favorably with such of theirs as we have had the honor of attending.

The "mallet" has not entirely superseded "hand pressure"

in all cases, yet it must be very flattering to Prof. Atkinson to see the great improvements made since its introduction.

Harmony and free interchange of ideas characterize all our meetings thus far.

CANADA JOURNAL OF DENTAL SCIENCE.

This sprightly little Monthly comes to grace our table again, this No. reaching nearly the middle of the 2d volume.

It contains the usual amount of interesting matter, and if we were disposed to criticise we should find less to find fault with than in many more pretentious works.

The editorials and original communications in this Journal are, to a great extent, free from some of the defects which have been quite too frequently found in many scientific publications, i. e., a failure upon the part of men writing, in recognizing the fact, that there is a wide difference between opinions and established truths, and consequently a wide difference as regards the importance which is naturally attached to them.

Nothing, at this epoch in the history of scientific progress, can so soon destroy all confidence in any scientific writer as the stating as facts theoretical doctrines and deductions, which have not yet been demonstrated to be true. We do not, by any means, desire to be understood as attributing to our Canadian neighbor only negative virtues, for its pages are full of life and vigor, and the dental fraternity of Canada are fortunate in the possession of so valuable and useful a Journal. J.

DEATH REPORT.

For Five Large Cities for the Month of December, 1869.

New Orleans, . .	population	200,000,	deaths	569
Cincinnati, . . .	"	230,000,	"	312
Boston, ...	"	240,000,	"	446
St. Louis, ...	"	240,000,	"	504
Chicago, ...	"	252,000,	"	436

C.

The Missouri Dental Journal.

A MONTHLY RECORD OF THE SCIENCE.

VOL. II.] FEBRUARY, 1870. [No. 2.

REPORT ON VEGETABLE PARASITES.

Presented to the Illinois State Microscopical Society, January 14, 1870.
By N. S. DAVIS, M.D., Chairman Committee.

Parasites are living organizations that attach themselves to, and derive their nourishment from, some other organic body. In one sense, vegetable parasites are such vegetations as attach to, and derive their nourishment from, other vegetable growths. In another sense, they embrace all parasitic growths of vegetable organization, whether attaching to other bodies of vegetable or of animal nature; and it is in this sense that we will use the term vegetable parasite, in this report.

We may divide the whole into two groups or classes. The first embraces such as are found attached to living vegetables only. The second, such as may spring up on either vegetable or animal matter, whether living or dead, under certain combinations of heat, moisture, and light. The first of these classes may be conveniently divided into two orders, namely: the green parasites, or such as have leaves or organs of respiration, through which they imbibe a part of their nourishment from the atmosphere; and the brown, which have no leaves or respiratory organs, but derive all their nourishment from the roots of the vegetables to which they are attached. They originate under the surface of the ground and shun the light. The first of these orders are described chiefly under the names of *Viscum* and *Loranthus*, while the second are represented by the *Orabanche* and the *Latharie*.

The second class are termed *Fungi* and *Entophyta;* or, in more familiar language, as mushrooms, mould, mildew, smut, rust, blight, etc. They belong to the class *Cryptogamia* of Linneus, and are distinguished from some of the other orders of that class, chiefly by their deriving their nourishment solely from the organic matter to which they are attached.

They are very numerous, Berkely having given about 600 *genera* and 4000 species, to which other investigators have added many more since.

To the unassisted eye, few things appear more dissimilar than the large fungous excrescences on forest trees, and the *mucedo*, or filament of mould; yet, under the microscope, all the varieties of fungi appear to possess a similar organization. They consist primarily of simple cells or spores, united in the form of lines. These may exist separately in the form of extremely delicate filaments, as the *mucor*, or common mould, or they may be aggregated in large masses of considerable density, as in the well known *boleti*, on the forest trees. Any detailed account of these primary formations, or attempt at classification, would be more tedious than profitable to this Society. For our present purpose, we may divide the whole of what we have denominated the second class into two groups. The first embraces such as are found growing on vegetable products, either living or dead, and constitute the Fungi proper; the second embraces such as are found attached to animal structures, more especially such as are covered with epithelial cells, like the skin and mucous membranes; these have been termed *Entophyta*.

Many of those embraced in the first group are of great importance to the agriculturist and fruit grower, because they are found to attack, and greatly injure, in different seasons, almost every variety of grain, fruit-bearing vegetables, and trees. The rust, smut, and mildew of wheat, rye, and corn, and the blight of the plum, cherry and pear trees are familiar examples, and are worthy of the most patient and careful study.

Many of the orders and species embraced in the second group, attaching themselves to man and animals, and found connected with various diseased conditions, have more particularly attracted

the attention of members of the profession to which I belong. For many years it has been claimed by some of the more eminent men in the medical profession, that some of the most common and important diseases that afflict man, both endemic and epidemic, are produced by vegetable parasites, belonging either to the class *algæ* or *fungi*. Nearly 30 years since, Dr. J. K. Mitchell, then Professor of Practical Medicine in the Jefferson Medical College, in Philadelphia, published a small work, embodying facts and observations strongly calculated to induce the conviction that our well-known intermittent and remittent fevers were produced by a species of microscopic fungi, developed on decaying vegetable matter, under the influence of heat and moisture. In 1855, M. Robin, of Paris, published his work called "Natural History of the Parasitic Vegetables, which Grow on Man and Living Animals." In this work the author enumerates ten species that attack the skin, and twelve the mucous membranes. As most of these are mere varieties, other writers have reduced those attacking the skin to three, namely: the *Tricophyton*, *Microsporon* and *Achorion Schœnlenii*. They present the most simple form of vegetable organization, consisting of mere spores, with occasional additions of *Mycelium*. They have been found in the different varieties of *Favus* or *Porrigo*, one variety of *Pityriasis*, *Mentagra*, and some forms of *Herpes* and *Eczema*. Thus far they have been found a constant accompaniment of such diseases only, as attack the hair bulbs, and follicles of the skin. Whether these parasites are the specific cause of the cutaneous diseases in connection with which they are found, or only accompaniments, is not fully determined. Most of the French and German investigators advocate the affirmative, while others, especially in England and this country, claim the negative. Erasmus Wilson, for instance, contends that the so-called parasites are properly degenerated products of epithelial and other cell formations, and are consequences instead of causes of the cutaneous diseases. Notwithstanding the recent investigations of Kœbner, Pick, and others, we think the view taken by Wilson is more nearly in accordance with all the facts.

Of the twelve varieties of vegetable parasites enumerated by

Robin as attacking the mucous membrane, six are varieties of *Leptonitus*, one of *Torula*, one of *Merismopœdia*, one *Oscillaria*, and one *Oidium*. To these may be added the *Cholera Fungus* of Brittan and Budd, and the *Palmellæ* or Malaria Fungus of Salisbury.

Although the varieties of parasitic growths mentioned by Robin have been observed on all parts of the mucous membranes of the digestive and urinary organs, only the *oidium* has been identified as uniformly connected with particular diseases.

This latter constitutes a large part of the white curdy exudation of the mucous membrane of the mouth, in thrush or miguet, and in diphtheria. The branch of our subject which has attracted most attention during the past few years, is that relating to the dependence of epidemic cholera on a parasitic growth, belonging to the order *Torulæ* or *Oidium*.

Brittan, Budd, Hillier, and others claim to have established the fact that the characteristic cholera evacuations by vomiting and purging, contain large numbers of vegetable spores, capable of rapid reproduction or multiplication. As seen in the recent rice-water discharges, they appear like the simplest form of *Sporule* or *Torula*, but by cultivation they are found to develope into the form of *Oidiæ*. It has been claimed and extensively credited, that these minute organizations were the active cause of cholera, and that the disease was actively propagated in communities, and from one place to another, by the cholera dejections containing these spores. During the last cholera epidemic in this city, 1866, we undertook a series of microscopic examinations, for the purpose of satisfying ourselves concerning a subject of so much importance.

We procured, in clean vials, samples of the pure rice-water discharges, of several patients in the active stage of cholera. Some of these were examined with a high magnifying power, within an hour after they were voided, and the examination was repeated daily, for five or six days. Pencil sketches were made of several of the views presented.. In all the earlier examinations, numerous minute, round, or oval bodies appeared in the field of the microscope, resembling the primary sporules of the *Torula*,

but not united together in linear form. After standing, however, from two to four days, these were, in a few instances, apparently united in the form of *Oidium;* and in one that was examined, after standing six days, there appeared two specimens resembling the penicillium.

[The speaker here drew an illustration on the blackboard, showing the field of the microscope.]

In addition to these vegetable parasites, all the specimens examined by me presented large numbers of *vibriones*, and two specimens of animalcule, differing from any that I had seen before. So far, the results of my microscopic investigations only corroborated the results of similar investigations made by others. But the question then came up in my mind, whether these parasitic formations were peculiar to the discharges of epidemic cholera, or were also to be found in any serous evacuation from the alimentary canal, such as occur in ordinary cholera morbus, cholera infantum, and serous diarrhœa. To determine this question, since the cholera epidemic has disappeared, we have from time to time procured and examined samples of the discharges, in the last named disease; and in no instance have we failed to find more or less of minute spores or bodies, which appear to me identical with those found in the discharges of the patients laboring under epidemic cholera. We are, therefore, by no means prepared to consider the origin and propagation of epidemic cholera as settled.

The subject requires much more extended investigation before we can draw reliable conclusions.

It has long been known that any organic substance containing *proteine* even in small quantity, in a moist state, exposed to a temperature of 70 to 80 degrees, with access to oxygen, presents, in a few days, products which under a good magnifying power have all the characteristics of vegetable spores.

If further observations should confirm the fact, that the fungous bodies described by Brittan, Hillier, and others, were present in the serous discharges from the alimentary canal, in other diseases besides epidemic cholera, it would not only disprove the theory that the last-named disease was produced by such fungi,

but it would go far to establish the position that they were the products of morbid secretions, instead of the cause. It is a fact worthy of note, that up to the present time, vegetable parasites have been found only in connection with diseases of such structures as are covered with epithelial cells, like the skin and mucous membrane, or on suppurative surfaces, where the organic cells are undergoing more or less degeneration. This legitimately suggests the question whether all these parasitic forms of matter are not the results of what Erasmus Wilson has styled *phytiform*—degeneration of cells and granules of animal matter? But aside from all such questions of a histological character, the study of parasitic growths in connection with the prevalence of diseases, especially of an epidemic character, is of the highest importance in its bearing on sanitary regulations and the health of communities. In this direction, some things of great importance may be considered as already settled. Whatever may be the differences of opinion among observers, in relation to the nature and mode of development of these simple parasitic bodies, found in connection with epidemic and some endemic diseases, all agree that their production and rapid multiplication are directly dependent on the coëxistence of three things, *viz.*: organic matter capable of undergoing degeneration or decay, moisture, and a temperature generally above 60 degrees F. If, with these, we have coincidently the exclusion of sunlight, we have the conditions most favorable for all vegetable parasitic formations. If the coöperation of these causes will generate a cholera fungus in the Valley of the Ganges, we see no reason why they will not do the same in the Valley of the Mississippi, or in Chicago. But whether the cholera fungus is generated here or imported from the other hemisphere, it is certain that without the coöperation of the three first-named conditions, neither it or any other fungus can be propagated to the injury of individual or public health. Hence, whatever contributes to the prompt removal, from this or any other city, of the decomposable organic matter, the surplus water or moisture, and gives to all its inhabitants air and sunlight, contributes directly to the preservation of public health.

OF WHAT USE ARE OUR PROFESSIONAL MEETINGS?

It contributes to improve us in our social relations, elevating us both intellectually and professionally, each contributing his share of Dental knowledge, acquired during the intervening time, noting what he may have seen or done, and communicating to his fellows what might seem to be important or useful; stimulates us to higher accomplishments, elevates us in each other's esteem, thereby indirectly in the estimation of our patrons—for in proportion as the brethren respect, and speak courteously of each other, so will our patrons estimate us, both as to our moral and professional character; our frequent gatherings prevent or annihilate that prejudice or jealousy that many of us may have been imbued with, and which is engendered and fostered by estrangement; it dissipates those disagreeable feelings some may have harbored while making a call on a brother chip—a consciousness of having a stolen sheep on his back, and a fear of being caught, perchance apprehensive that some of his own patients might see him, and he thereby be lessened in his patrons' estimation.

Let us take another view of our meetings. When anything new or useful is presented, and we make no objection to it, giving it at least our silent approval, do we always try it and ascertain for ourselves its relative merits, or, after trying it, do we report the same at a subsequent meeting, relating our own experience? Not very often—and yet it is our undeniable duty, for by doing so we give encouragement to those who freely communicate their experiments. Why is it we have so many patents in our profession and none in the medical branch? (save patent medicines)—and yet there are as many improvements made for the amelioration of suffering humanity, in that branch as in ours. That question was asked not long since. This rich answer was given: "Dentists generally were such *worthy* subjects to be Doestick's companions—that it required a patent, to make a Dentist try it, take hold of it, and use it." I thought the man was disposed to be cynical, particularly so when he added: "They wont try anything good or useful, or pay any attention to it—

unless it is ushered into their presence by a patent—then he at once becomes convinced—or instruction from a clever peddler forces conviction, and the tin is transferred." Some time since Prof. Judd presented improved pluggers, to facilitate the filling of the distal proximate cavities of the back molars, no report made. Prof. Eames obtained a duplicate set, no report from him. I borrowed his pluggers, used them, found them a decided benefit, no report from me. I was favored with a loan of Dr. Morrison's Dental Chair, found it to be superior to any I had previously used, and yet I have manifestly been delinquent in not having reported. This remissness on our part to report has a tendency to discourage any one from presenting any useful offering, and yet that simple offering might prove of great value.

Again, for many years I have been in constant use of Mr. Chas. Hunt's diamond dust, (as he calls it,) and it was pronounced to be the best material for smoothing and polishing India Rubber plates, requiring only one grade and accomplishing the work in less time, and I was so highly pleased with it for finishing fillings, that I sent samples to several dentists abroad —no report from any on its comparative merits,—and from only one acknowledging thanks for sending it,—yet, I continue its use in preference to any thing else.

Again, how many of us have tried the suggestions of Dr. Black, in so far at least, as never touching the foil with our fingers? Who has ever tried the wooden compressor instead of the tin, or the chamois foil roller instead of the india rubber? We know that every little, apparently insignificant, item that has any tendency to deteriorate the essential properties of the foil, must in the aggregate, destroy its integrity, and thereby prevent us from realizing those agreeable anticipations when we say to ourselves "I intend to spread myself in filling this tooth."

The simplicity of many offerings may cause an indifference to give it a trial, when in fact, its simplicity makes it the more important, and offers greater facilities for instituting a comparrison on its merits.

When any member relates his experience he believes it to be

new, and beneficial, both to us and our patients, either in Medicine, or Surgery, or Mechanical Dentistry, and it, therefore, becomes our courteous duty to investigate the same and report.

This applies not only to those subjects related in our society, but also those presented through the medium of our journals, for by so doing, we are much more likely to retain it in our memory, and will better enable us to maintain the enviable reputation we now enjoy among our professional brethren abroad—preventing us from becoming old fogies, or Doestick's companions.

F.

Operative and Surgical Dentistry.

PREPARATION OF CAVITIES.

The preparation of cavities in the operations of plugging teeth is of equal importance with any other manipulations. The permanence of the operation very much depends upon the shape given to the cavity of decay. The *approach* to the cavity is very properly included in the term PREPARATION OF CAVITIES.

Case 1. Cavity of decay midway between the triturating border and the neck of the anterior approximal surface of the right upper third molar. The second molar lies in close contact with the latter. The cavity is discovered by a small excavator, and by shadow of color. Before preparing this cavity let us examine the second molar. A shadow of discoloration, indicating decay, is seen on the enamel of the grinding surface of the latter. A cavity of decay is also found extending from the posterior crevice of the triturating surface.

We will prepare the *second* molar for plugging before attempting the first; the reasons for which will be seen hereafter. We find the former decayed from the crevice on the triturating surface through the posterior approximal surface. This is a com-

pound cavity, and is properly treated by cutting the dentos* away with chisels so as to have both cavities thrown into one, and without any posterior wall remaining. Now that this posterior wall of dentos is removed we can see and approach the cavity in the third molar, with perfect ease. To attain this easy approach was the reason why we prepared the cavity in the second molar first.

When one approximal cavity is found, another, opposite, in the adjoining tooth is very likely to be present, and we ought by all means to avail ourselves of the advantage offered by the necessary cutting away of the posterior wall. It is not *always* necessary, to be sure, to cut away this wall, but it is so often desirable, that the fact should always be kept in mind when we are making examinations of the teeth.

If the second molar has not been decayed, we would have then cut through the triturating surface of the third molar near the anterior approximal surface with a crescent-headed drill, until we had reached the cavity of decay. We then would remove the anterior wall of this cavity its whole length. The shape of a section of this slot, should show a dove tail.

We would not file these teeth apart until this cavity was filled. Then use a No. 1 Froid, mainly to give good margins and polish to the plug. By packing the gold so as to have it press against the second molar, from the commencement, the latter tooth would be forced away from the third molar, and thus a quantity of gold extend *beyond* the cavity, so that when we commence to use No. 1 Froid, we find that we are not cutting away enamel from either tooth, but gold only. CHASE.

POLY-CYSTIC TUMOR OF THE ANTRUM.

Mrs. T., age 43, was directed to me by Dr. H., to extract the left second upper bicuspis. Condition of the patient. In general good health. A large swelling occupies the entire space between

* Dentos—tooth substance, without reference to its histological tissue.

the left upper canine and the tuberosity of the maxilla, on the buccal surface of latter. The cheek itself is not swollen. The soft exterior tissues of the tumor have not the ordinary appearance of inflammation. The second upper bicuspis is decayed to pulp cavity, but not necrosed. There is no tenderness of the tumor on pressure, which is soft, having the appearance of fluid contents, and yet there is no fluctuation; no pain results from the presence of the disease. Dr. H., who sent the patient to me, diagnosed disease of the antrum, as a result of the defective bicuspis.

History of the Case.—When thirteen years of age this tooth ached, and subsequently there was a discharge of purulent matter near the end of the root; this condition continued about two years without treatment, when all unpleasant symptoms subsided. About one year ago, or nearly thirty years after this abscess, there appeared a "slight lump" on the site of the present tumor, and without pain. This has continued to increase in size, without painful symptoms, until the present time. There never has been any discharge from the nostril of the affected side.

I diagnose tumor of the antrum.

I now extract the bicuspis; following it came a stream of sanguineous matter, filling the alveolus and running into the mouth. The stream ceases and the tumor has not decreased in size. My friend, Prof. Judd, whom I have called in to see this interesting case, presses on the tumor and a wall of a cyst suddenly gives way and another stream of purulent matter appears in the alveolus. The anterior portion of the tumor is evidently nearly empty. I pass a long exploring instrument about the size of the smallest knitting needle, easily, through the alveolus into the antrum and explore every portion of it. It seems to be filled with a spongy mass of soft tissue. I cannot move the instrument sideways, but I can push it endways to any part of the cavity. Very little blood is the result, and no fluid is thereby evacuated.

It is not unlikely that a large portion of the antral wall corresponding with the site of this tumor is absorbed.

As the patient is not mine to treat for this disease, I send her back to Dr. H., her family physician, with a note stating my

diagnosis, and suggestions as to treatment, which are to syringe the antrum with diluted tincture of iodine, after breaking down the walls of the various cysts with a small sharp instrument.

CHASE.

PRACTICAL HINTS—PRESERVATION OF ROOTS.

Convinced, as we are, of the inestimable superiority of Man's "Natural Organs," as compared with those of an "Artificial character;" also perceiving that the efforts of the eminent surgeon are directed so as to retain as much of that limb as possible when he may be called to amputate,—Do we not, as dental surgeons, "commit a grave error when we fail *so to exercise our*" manipulative efforts in relation to the teeth?

With most operators the practice of extracting *all* whose crowns may not be susceptible of a filling, seems universal. But with a few the *retention* of that portion still remaining, if solid and sound, or that may be made so, are regarded as indispensably necessary to the future welfare of those contiguous to them.

Although *we* are poor; high taxed for the necessaries of life; Yes, and love money muchly; yet, nevertheless, we still adhere to our doctrine, adopted several years since, in *striving* to save all the roots of crownless teeth whenever the indications seem favorable. Of course, these indications will be found at variance with many of the profession. What in one case might seem as a clear proof for extraction, to another would prove just the reverse; and, perhaps, to most operators, the very idea of laboring in this direction would be deemed by them as throwing away money and time uselessly; but to such we state, emphatically, when we say that of our own past experience, we feel highly remunerated and encouraged to continue. If we fully comprehend the true motives, as embodied in the science we profess to represent, we believe it to consist in the "bestowal of the greatest good to mankind." Most of our patients depend upon us as "humanitarians in our indulgences." Many of them naturally possess timidity of no ordinary degree, and often do we observe

upon their countenances an expression of the very height of joy, when we inform them that "this tooth," or "that one," may escape the grasp of the merciless forceps. With another class, the very sight of an artificial denture proves disgusting to their more refined taste. Hence, as far as the peculiarities of these two classes in particular are concerned, throwing out entirely those who highly appreciate talent and skill, the remunerating point lies in our favor, from the fact that the former are too glad to escape the misery consequent from the extraction, while the other see no alternative. Thus both will readily agree to give us the boon we may require, and the latter class will also commend us in the highest of terms.

We do not profess success, nor should we undertake every case where the roots were decayed to a mere conical shell, or where the recuperative energies were, in a great measure, reduced by scrofulous, syphilitic, and mercurial disease, or again, by habitual indulgence in strong drinks.

Still, notwithstanding the above evils, we feel satisfied in the assurance that we save nearly 75 per cent. of the number we treat. Again, we profess freedom in the assertion that at least 50 per cent. of the number of those teeth whose crowns are excessively destroyed by decay, which are lost by extraction, might by judicious treatment, be made to serve far more fruitful use in mastication than the very best artificial substitute extant. A sound or solid root in the alveolus is not more liable to occasion disease than any other tooth, if properly treated. We find those disadvantages arising from their loss quite marked; for instance, the change occurring in the gum and alveolus, whereby the symmetry and beauty are marred, and that once natural form of expression destroyed forever.

Again, through their absence, those teeth situated in close proximity lose their natural support, and are thus thrown from their normal position, owing to the absorption of the septum and marginal portions of the alveolus surrounding them. Thus that nicety of antagonism so very important in the occlusion of the jaws becomes destroyed.

These affected teeth deviate from their vertical to a more hori-

zontal position, in many cases nearly, if not quite, touching the base of the gum with their anterior conical edges, in which condition the accumulation of tartar more readily occurs, and the ultimate loss of perhaps a sound tooth.

We say thence, brethren, save *more* "of the roots."

Where a portion of the crown is still standing, we carefully clip it off and dress down to as smooth a convex surface as possible, whereby no lodgement of food may occur, thence fill the fangs with gold; if purse will allow, the entire surface of the cap with same material, cutting grooves, and retaining points, same as with other fillings, otherwise we use tin foil, but never amalgams, as the use of this base material would bring about just the annoyance we endeavor to shun, that of ulceration and loosening of the roots.

We deem gutta-percha as invaluable for filling the nerve canals, protecting the more exposed portion with metal. Where pulp is alive we of course devitalize. If case is one of abscess, treat as usual. When the gum surrounding is purulent, spongy and tender, deplete with sharp-pointed bistoury, and employ astringent power. We devote particular attention in behalf of the bicuspides and 1st molars of each jaw. Though we are not a city practitioner, where skill and talent are *sought* after and *paid for*, still, notwithstanding, we say to our country brethren, for whom our writings are always directed, that this branch of our practice will not only pay as far as money is concerned, but in a double point of view, by increasing the standard of our manipulations to an eminent degree.

BREWER.

Chillicothe, Mo.

(To Students.)

INSERTING THE GOLD.

CASE.—Anterior approximal surface of the right upper third molar. Dovetail slot cut from the grinding surface of crown up to the margin of gum. Soft wedge between the teeth to compress the gum. Rubber dam not required.

Place a cylinder of unadhesive gold, whose diameter is equal to the bucco-palatal diameter of the cavity, in the bottom of the latter, one end of which shall press against the posterior wall of the cavity and the other end against the surface of the second molar; compress this cylinder laterally, and place another by its side; now with a foot-shaped plugger having sharp serrations condense with the mallet, thoroughly.

Put a *very thin* section of Morgan's plastic gold upon the condensed surface and mallet again.

The foundation which is now laid will not be likely to move, if it is sufficiently condensed. Too much care cannot be exercised in this respect. It is of the greatest importance that the cervical margin of the plug should be *perfect.* No after manipulation can correct a faulty margin in this locality.

The cavity described can be better plugged with two different sizes of foot-shaped pluggers than with any others. They should have shallow but very sharp serrations. The toe of the instrument should be slightly rounded and polished, so as not to abrade the dentos* as it slides against it.

This cavity will be best plugged with heavy or thick foils; No. 30 may be used in strips one-eighth of an inch wide and one inch long. No. 60 in squares, not much larger than the diameter of the cavity. Take up No. 30 with the pluggers in the middle of the strip or at the ends, indifferently, and attached to the previously condensed gold. Anneal each strip by carrying it *over* the alcohol flame. Condense *single* thicknesses in succession against the sides of the cavity, and *particularly* against the margins, so as to make them as *perfect* as possible. In the centre we may fold or crumple it up indifferently, remembering that with increased thickness under the plugger we must have increased mallet force.

We can use No. 60 alternately with No. 30, if we choose, and using two or three squares of the former at once, as they will readily adhere to each other and to the previous surface if properly condensed. If the margins of the cavity have heavy walls

* Tooth substance.

we can safely use No. 60 at the margins, though I can see no particular advantage in this heavy No. in *this* cavity. We don't wish to keep one portion fuller than another; it will be better to keep a nearly level surface. At any rate do not fill the interior of the slot more rapidly than you do the marginal surface. Carry the gold well out beyond the surface of the tooth, so as to leave plenty to file off and work down afterwards. Keep the shaft of the plugger parallel with the perpendicular margins of the cavity. Let the foot shaped plugger slide along these surfaces and carry down the gold strips. Always allow the strips to lie between your plugger and the dentos, thus ensuring more *perfect adaptations.* If there should be any overlapping enamel, when it is reached we must be careful that we do not arch over or bridge the under cut. Take the curved hatchet plugger and carefully manipulate into the corner or crevice single layers of Nos. 15 or 20 foil, using hand or mallet pressure, according to safety, being sure to thoroughly *support* this overhanging enamel, with a solid foundation.

The gold plug should be well carried out beyond the grinding surface of the tooth, so as to insure sufficient thickness for subsequent removal for the purpose of finishing. Be careful not to draw in the approximal surface of your plug, as you build up to the triturating surface. If it is kept squarely out *all the time,* it will be stronger and bear the force of mastication much better, than it will, if you build it out from the slot. In the latter case it would be more likely to scale off. When enough gold has been used, go over the whole surface with a very small, round plugger, having only enough serration to prevent the instrument from slipping, so as to thoroughly condense the gold and obliterate the indentations. Now file down to nearly the finishing surface and condense again in the same manner. File again, and then polish with abundance of pumice stone and a stick. After getting a good surface, use prepared chalk and alcohol with a stick.

I expect in a few weeks to have an instrument, which will revolve a burr one thousand times in a minute. With this I intend to finish my plugs in very many localities.

CHASE.

HEAVY FOILS.

The number of dentists who use the heavy foils is rapidly increasing. Dr. Atkinson, of New York, deserves the thanks of the profession for bringing them again to its notice.

Dr. Arthur, of Philadelphia, many years ago advocated the use of Nos. 10 to 15. That was before mallet pressure was known. Foils as heavy as 30, 60 and 120 could not easily be manipulated by hand pressure, and one cannot go much higher than Nos. 10 or 15, even with a single thickness of a leaf, by hand pressure alone.

When new fashions are introduced many persons go to an extreme which is ridiculous; and so in the use of the heavy gold there is danger of going to an extreme which is neither desirable nor useful, but on the contrary injurious.

Undoubtedly two pure gold plates of No. 20 of the gauge could be welded together by serrated instruments and sufficient mallet force.

Now the thickness of our gold foils must be adapted to the strength and condition of the tooth which we are to plug.

A certain amount of mallet force will cause pericemental inflammation in one tooth, which would be perfectly indifferent to another tooth. The enamel which would remain intact from any number of blows of a definite weight, from the mallet, in impacting a gold plug, would crack in one or more places by *increase* in the *weight* of blows, given to the gold alone. We have all seen cracks occur in the enamel from concussion produced by blows from the mallet.

The force which is given by a mallet to a plugger, placed on the mass of a gold plug, is diffused throughout the whole substance of the plug, and also every portion of the crown and root, and even to the maxilla itself. Now this concussion produces cracks in the enamel which are injurious to the integrity and durability of the tooth. Therefore the blow should be brought down to that degree of weight which the dentos is able to bear with impunity.

The smaller the mass of gold under the plugger the less force

is required for welding. Therefore, the smaller the point of the plugger the lighter may be the blow to produce the desired effect.

To ensure the welding of No. 120 gold foil, without *too great concussion*, we must use pluggers with very small points. Those measuring No. 20 of the gauge plate are as *large* as should be used for No. 120 foil. Smaller ones than these must be more generally used, especially in those places where great strength of plug is required, and the greatest perfection of welding desirable.

For the *margins* of *approximal* cavities, I prefer No. 30 foil, and also for delicate margins on the crowns of biscuspids. The approximal cavities in the incisors, I think, are also easier plugged with Nos. 20 or 30, than with 60 or 120. The undercuts that must be plugged by hand pressure, are also best filled with No. 20.

Nos. 60 and 120 are best manipulated by being cut into small squares, not so wide as the diameter of the cavity; or by oblong squares, three times as long as wide. They may be consolidated best, by laying them flat and using one or two thicknesses at a time, for impaction. In moderately large cavities, having heavy walls, they may be placed flatways, or edgeways, indifferently. Against the perpendicular walls, it is best to let a small portion of the flat side lie, and with a foot-shaped instrument impact it against the wall at an acute angle.

Nos. 20 or 30 can be used in most cavities, without reference to the position of the strips. I cut these numbers into strips, from a half inch to an inch in length, and from one-sixteenth to one-eighth of an inch wide. But a more even surface can be kept by *folding* any of the heavy numbers upon themselves flatways.

When the surface of the cavity is nearly approached, a more satisfactory plug will be made by always laying the strips flat. Minute depressions are thus avoided in the face of the plug when it is polished.

Have I abandoned No. 2 gold foil? No. There is hardly a day that I do not use it in connection with the heavy foils. I use No 2 in situations where *strength* of plug is not required,

and when density is not desirable. Strength would not be required in the bottom of a *simple* crown cavity, even if very large. Density is not desirable next to a nearly exposed pulp. A plug of a given size will weigh more if made of No. 60 gold, than of No. 2. The greatest possible solidity in a plug is not *always* desirable. The nearer we can approach to the density of the Dentos* itself, and at the same time, ensure strength and the exclusion of fluids, the better.

CHASE.

From the Philadelphia Dental Times.

OXYCHLORIDE OF ZINC AS A CAPPING.

BY J. S. SMITH, D. D. S.

Since reading the report of Dr. Salmon, of Boston, (which, by the way, I find to be very instructive,) upon the subject of the application of oxychloride of zinc to exposed pulps; and, also, an article written by Dr. James Truman, DENTAL TIMES, Vol. VI., July, 1868, I have been experimenting, to some extent, with this agent, as a capping, with varied success. I might say of all cases treated in this way by me, two-thirds of the number have been successful so far, to the best of my knowledge. The failures may be attributed to the lack of sufficient patience upon the part of the patient, through a dread of again being compelled to have the case treated, or the tooth removed.

The pulp and the parts about the tooth or teeth should be in a healthy condition before capping. In my judgment, a bleeding pulp should be gently syringed with tepid water, and the hemorrhage should subside prior to the application of the cap, else the coagulated blood would increase the bulk under the filling and upon the pulp, causing undue pressure upon that organ; consequently, pain follows, and a probable necessity to destroy its vitality. The pain, however, may subside for a time from pressure, which of itself, in many instances, would not be sufficient to endanger the vitality of the pulp; but the gas that may be

*Tooth substance.

generated from the coagulated body may set up an irritation in time. Thus the pulp may be said to be in danger from both; pressure upon the one hand, causing inflammation and suppuration, and gas generated, causing irritation and finally abscess.

This, I am aware, is but theorizing on my part. If I have strayed into error, I await patiently for some one interested to let his light shine through the medium of this Journal, for the benefit of those who are laboring in the same common cause. "It is certainly desirable always to save a part where it is possible so to do," says an eminent operative dentist and professor. Oh, if the profession had more of that mind and ambition of making efforts to investigate, that we may learn to save, as well as destroy, the organs that are entrusted to our care.

The dental surgeon should be as conscientious upon this point as the general surgeon is supposed to be in saving the arm or the leg when diseased.

The further we can advance in the healing art of dentistry, the higher we are elevated as scientific men. And I trust the day is not very far distant, when the profession, or the specialty of *dentistry*, will stand shoulder to shoulder with general medicine and other specialties, and be respected as such by the world.

Columbia, Penna.

(*From the Boston Medical and Surgical Journal.*)

CLINICAL EXPERIENCE WITH CHLORAL.

Translated by Robert Amory, M. D.

Having come across the review by Dr. Bricheteau of the experiments on chloral made by Messrs. Liebreich, Dumas, Richardson, Spencer Wells, Dumarquay and Follet, Dieulafoy and Krishaber, Labbè, Guyon, Giraldés and Worms, Bonchut, and Personne, as well as some results of clinical experience by the reviewer, I translate his conclusions for the benefit of your readers, who may not have seen his article in the *Bull. Gén. de Thér.*, Nov. 30th.

1st. Hydrated chloral, or chloral hydrate, is a powerful sedative to the nervous system, both motory and sensory.

2d. If the hydrate of chloral is not crystalline and very pure, so that in the evolution of chloroform by the addition of potass. there is no brownish color produced in the residuum, it is either without action or may be very dangerous.

3d. A larger dose than 75–90 grains (5–6 grammes) should not be given at any one time to an adult, and to a child the commencing dose should be 15–30 grains.

4th. The preparations of chloral ought not to be made too long before the administration, for they lose their character and become inefficacious.

5th. The administration may be made by the mouth. Baths produce the same effect as when the stomach is used, but the latter is the best method.

6th. Its use should not be employed in patients who have organic disease of the heart or brain.

7th. It is on account of the production of chloroform in the blood, from its alkaline reaction, that the ingested chloral produces sleep and anæsthesia.

8th. It is dangerous in man to employ its hypodermic injection.

9th. The arterial tension is augmented by the influence of chloral, at the same time that a diminution in the frequency of the pulse is produced; this tension diminishes on awaking, as the sphygmographic trace indicates.

10th. The urine during the sleep produced by chloral is neutral; and, boiled with Fehling's liquid, it does not reduce at first the copper salts; but the next day it becomes, when the chloral has passed through the kidneys, more dense, and will cause the reduction of the copper salts; this may cause a belief in the presence of sugar in the urine, which does not in point of fact exist.

11th. Hydrate of chloral rarely causes vomiting, and never purges.

12th. The temperature is slightly lowered by doses which are not toxical, which points to its being an algid medicament.

13th. By the hydrate of chloral the cutaneous perspiration is diminished, and the skin becomes dryer than in the normal state.

14th. This drug can be precisely dosed for the efficacious production of anæsthesia; whilst in the inhalations of chloroform for the same purpose, the vapor cannot so be dosed. The certaunin use of chloroform vapor makes its use very dangerous.

15th. The action of hydrate of chloral is exactly that of chloroform, but its production is slower, and its duration longer if the chloral is used.

16th. In some patients submitted to the action of chloral there is a muscular and moral excitement similar to alcohol drunkenness; but this intoxication is not disgusting nor disagreeable.

17th. In almost all there is a sleep, remarkable from a very pronounced anæsthesia, and rarely accompanied with hyperæsthesia.

18th. The anæsthesia is proportioned to the dose employed, and in the dose of 30 to 75 grains, according to the age, it is complete, and the cautery of Vienna paste may be used, or even teeth extracted, without causing pain.

19th. Compared with opium, which often causes vomiting, which destroys the appetite, which stimulates, heats, constipates, excites the cutaneous transpiration, produces slowly a heavy sleep, and leaves after awakening a *malaise* from prolonged sleep: hydrate of chloral does not produce vomiting, does not constipate nor destroy the appetite; it dries and may even cool the skin; it quickly causes a light sleep which lasts some time; finally, on awakening, it leaves no heaviness of spirits nor feelings of somnolence, and can be taken several days in succession.

20th. In a large dose, this drug produces algidity, whilst opium produces heat and diaphoresis.

21st. A dose of 45 to 75 grains can be repeated two or three times a day without inconvenience, and there results two or three times several hours of sleep, separated by a short interval of wakefulness.

22d. As a therapeutic agent, the chloral is sedative to violent pains in gout, to atrocious sufferings from nephritic colic or from dental caries, or from burns. In other words, it is the prime anæsthetic administered by the stomach.

23d. In the cases where a resort to chloroform is made, the chloral can be used to appease the pangs of natural parturition, to facilitate obstetrical operations and to combat puerperal eclampsia.

24th. Finally, it is the most prompt and efficacious remedy to employ in intense chorea, when we wish to cause a rapid cessation to an agitation which of itself threatens the life of the patient.

Why will not some of your readers who have a large obstetrical practice, test its benefit in parturition?

Mechanical and Miscellaneous Department.

CHEAP PLATES.

We offer no apology for our frequent recurrence to this subject, knowing full well that a large proportion of our subscribers outside of the large cities, are much interested in this subject, this being their most lucrative practice. We do not propose to sermonize upon this condition of things, recognizing the fact that a practical man takes things as they really are, and deals with them accordingly; whilst impracticable persons are apt to set up ideal creations and adapt their thoughts and actions to correspond with the varied forms and conditions of their created idealities. Now, although we fervently desire the advent of that good time coming when much more attention will be paid to saving teeth than to supplying artificial ones everywhere, we are well aware of the fact that this is not now the case in all localities, and that when teeth are once lost they "are lost forever," and their place must be supplied, in many cases, not perhaps in the best, but from necessity, in the cheapest manner.

In the last number we spent considerable time in examining the merits of the so-called adamantine bases and we propose now

to examine the aluminum base. This is coming rapidly into use in this vicinity, especially for full plates, and has generally given satisfaction. The aluminum however requires some more labor than the adamantine work, the expense of the two being for material not much if any more. The aluminum is strong and very light, and in a great majority of cases resists the action of the juices of the mouth better than any other cheap base yet used. The plate must however be struck up in the same way as a gold or silver one, and this necessitates an extra amount of labor. As the metal swages, however, very easily, much more so than gold or silver, it does not add very much to the amount of labor required. In swaging aluminum it should be very frequently annealed by holding it in the flame of a lamp for a short time, the blow-pipe not being required.

The attachment of the teeth to the plate is very easily accomplished. They may be attached by two or three different methods. The various solders for aluminum I have not tried, but the method known as Hale's patent makes a perfectly strong and reliable connection, using either rubber or adamantine metal for this purpose. This may be done likewise by turning up small points upon the plate, under and near the heels of the teeth, with a graving tool, and either packing in rubber and vulcanizing, or by casting adamantine metal; either process being exceedingly simple, and either making a perfectly reliable connection. The plate, when adamantine metal is used, is slightly heavier than a rubber one, but if the amount of metal used for this purpose be restricted to the minimum quantity, that will effectually answer the purpose. The difference will be so small that it will be no serious objection.

If the adamantine metal is used for making the connection between the teeth and the plate, the piece is much more cleanly than if rubber is made use of, inasmuch as the juices of the mouth always find their way between the rubber and the teeth, and, as is the case in all rubber plates, decomposition takes place and the piece becomes exceedingly filthy. As these plates cannot be made quite as cheaply as the adamantine bases, and moreover, as there are many practitioners who are not familiar with

the process of swaging plates, we do not expect to see the work in as general use as the cheaper bases. But we are satisfied of its utility and reliability, and carefully and skillfully worked it will give general satisfaction. J.

BOGUS DIPLOMAS.

In the December No. of the Missouri Journal, we published a correspondence between Dr. Taylor, of Fort Madison, Iowa, and a certain party in Philadelphia, signing himself A. J. Hale, M. D., in relation to the very *honorable* business of trading in Diplomas, Medical, Dental and Literary, anything to suit the tastes of the purchasing party.

The profession are under obligations to Dr. Taylor for his complete exposé of this swindle, and had it only implicated the dental fraternity and had not also proposed to deal in bogus medical degrees as well, the medical press would have rested perfectly quiet, without once expressing a single word of disapprobation, considering it of too little importance to merit even a passing rebuke. But now we find several medical journals ready to condemn, in unmeasured terms, this monstrous invasion of the rights of regularly conducted collegiate institutions, and we only hope, that when the pure mind of the medical fraternity is once waked up upon this point, a passing thought will be given to the consideration of the propriety of some of the common practices of many medical men, who would be horrified if suspected of having any intercourse of a professional character with a medical practitioner who habitually disregarded the code of ethics, but who will send their patients to a dentist who has his office plastered all over with flaming advertisements, and whom every respectable dental practitioner would consider a disgrace to the profession. If these gentlemen would consider for a moment, they would probably come to the conclusion, that as a medical quack is at once recognized by an honest medical practitioner, so likewise an honest dental practitioner recognizes at once the dental quack; and it would be far better for medical men and for their

patients too, if they would only remember that dental quackery is, to say the least of it, no less despicable, and no less dangerous, than quackery in general medicine, and the medical practitioner who is guilty of recommending these mountebanks to his patients, is no less guilty of a crime than he would be, if he would recommend his patients to the thousand and one medical charlatans, who infest the country like a swarm of locusts, and who would, if it were possible, "devour every green thing."

But now that the medical world has been awakened to the fact, that these bogus sheepskins are being distributed throughout the land, will they take as active and efficient measures to protect the local and national Associations from being contaminated by the presence of the holders of these certificates of infamy as have several of the State dental and the American dental associations. We shall see.

We must not hastily conclude, however, that Philadelphia has the sole honor of being engaged in this traffic, for from the Chicago Medical Examiner we learn that Milwaukie comes in for her share of the glory of having one of the "chartered Institutions," which are ready to accommodate those gentlemen, who are in search of cheap honors.

Other cities, undoubtedly, are fully as well supplied, and we are looking daily for some flaming announcement, headed "Steam Dental and Medical Diploma Establishment, &c., &c."

J.

SERRATING GAUGE.

By J. G. Willis, M. D., Cincinnati, Ohio.

All dentists, who, from the nature of the circumstances by which they are surrounded, are compelled to point their own instruments, feel the want of some device by means of which that work may be simplified, and thereby rendered more easy to perform. It requires the best skill and constant practice to serrate pluggers accurately, and even from the hands of such persons, we too often find, that the instruments we have pro-

cured are worthless; dragging the gold, thereby damaging the plug and our tempers at the same time.

The necessity often arises that an instrument should have its points repaired at once, and without loss of time. And many times we have to originate a new point, and make the serrations without any old channels for guides. A plugger may be repaired by a skillful hand by aid of a good glass, and put into tolerable shape; but the serrating of a new point cannot be done perfectly by the most skillful hands unaided, so that a good glass will not detect great irregularity in the width of channels and size of points. The great difficulty which stands in the way of success, is the impossibility of spacing off evenly the surface to be serrated. When the spaces are unequal, the teeth will vary in size and length, which renders the uniform condensing of gold impossible.

Having had, in common with all others, great tribulation in this way heretofore, I am now happy to be able to say, "that source of trouble is ended." For I have invented an instrument which makes the serrating of pluggers a pastime; and it renders the operation so easy, that any one can do the work. As I have before said, the whole trouble in this kind of work is in *spacing accurately* the surface to be serrated. I accomplish this heretofore difficult task, without a glass even, by means of the instrument described hereafter, and which I have named the "Serrating Gauge."

The gauge, (see cut,) is made in the following manner: Take an old excavator and cut off the turned end, near enough to the handle to secure a diameter of one-eighth of one inch, dress each end to a plain surface, at a right angle with the shaft; with a file bring one side down to an even flat surface; on this flattened surface file the notch C, commencing one-sixteenth of an inch from one end. The notch should be equal in depth to the required serrations, the length of the notch is immaterial. Form the point A to correspond in shape, size and length with the required serrations. The length of the projection B, should be

equal in width to the point A at its base, or the width of the required serration. This projection is formed by simply dressing off the end, leaving the portion B. When the gauge is formed the ends should be tempered as hard as possible.

To use the gauge, secure the plugger, or instrument to be serrated, in a vice, place the end of the gauge against the side of the plugger, letting the projection B rest on the edge of the surface to be serrated. With one of Froid's beveled separating files make the first serration by placing the flat surface of the file firmly against the end of the projection B, and drawing the edge across the face of the plugger until the required depth is secured. Change ends with the gauge placing the point A in this first channel or serration, holding the handle of the gauge parallel with the face of the plugger, bring the flat surface of the file against the end of the gauge as at first, and proceed to make the second channel; when done, move the point A forward to this channel and make the next, and so on till all are completed. Finish up the serrations without the gauge, with the aid of a magnifying glass, making the channels and teeth perfect and smooth with a smooth finishing file, or Arkansas stone, in the form of a thin sharp edged slab. I send a specimen of the work done by the aid of the gauge in five minutes, which I will defy any man to equal in regularity, by the eye alone, in two hours time.

If this little instrument proves as useful to others as it has to me, I shall be highly gratified and well repaid for the trouble of calling attention to it.

A Bill for the Suppression of Dental Quackery and the Encouragement of Scientific Attainments in the Profession of Dentistry.

Section 1. *Be it Enacted by the General Assembly of the State of Iowa*, That it shall be unlawful for any person to practice Dentistry for compensation, unless such person has received a diploma from the faculty of a Dental College duly incorporated under the laws of this or any other State of these United States or foreign country, and duly

recognized by the American Dental Association, or has a certificate of qualification from a board of examiners hereinafter provided, or has a certificate of membership of the Iowa State Dental Society.

SEC. 2. The Governor shall appoint persons recommended by the Iowa State Dental Society, who shall constitute said board of examiners, whose term of office shall continue for three years, and until their successors are appointed.

SEC. 3. Said board shall consist of six persons who must be graduates of some regular dental or medical college, or possess the evidence of qualification contemplated in this act, and be in regular daily practice of dental surgery.

SEC. 4. The following shall be the division of said board, namely:

One on Anatomy and Oral Surgery.

One on Dental Physiology and Histology.

One on Dental Pathology and Therapeutics.

One on Dental Chemistry.

One on Operative Dentistry and Hygiene.

One on Mechanical Dentistry and Metallurgy.

SEC. 5. Said board shall hold annual session for the purpose of examining applicants at such times and places as the Iowa State Dental Society may appoint, and shall give public notice of such meeting for at least sixty days.

SEC. 6. Any member of the board of examiners, on satisfactory examination of applicant, shall grant a permission to practice until the regular meeting of the board.

SEC. 7. Each applicant shall, on receiving a certificate, pay into the treasury of the Iowa State Dental Society the sum of ten dollars, which shall be used in the formation of a dental museum and library.

SEC. 8. Any person who shall practice dentistry without having complied with the requisitions of this act, shall be deemed guilty of a violation of law, and upon conviction thereof before a magistrate, shall be fined not less than fifty nor more than two hundred dollars for each offence, which shall be collected as other debts are by law collected.

Provided, That nothing in this act shall be construed so as to prevent physicians and surgeons from extracting teeth.

SEC. 9. All fines imposed and collected under the provisions of this act, shall be payable one-half into the County Treasury, where such conviction shall take place, for the use of the common school fund, and one-half into the Iowa State Dental Museum and Library fund.

SEC. 10. This act shall go into effect January 1st, A. D. 1871.

We have received the above copy of a bill which is now under consideration in the Iowa Legislature, and which we trust will become a law. We would have been better pleased with the heading of the Bill, however, if it had read "A Bill for the Protection of the People of Iowa from the Impositions of Ignorant and Incompetent Dental Practitioners and for the Encouragement, &c.," as above.

The passage of this bill will not benefit pecuniarily the competent Dentists of the State, but it might save a quarter of a million a year to the honest citizens, besides a vast amount of suffering and many valuable lives. Only a few weeks since I was consulted in a case which had been in the hands of a practitioner a year before, but he was not sufficiently enlightened to diagnose the case, thinking it an unimportant ulcer of the mucous membrane of the mouth. Two or three teeth had become loose and had been taken out by the dentist without arousing any suspicion of danger; but at this juncture the patient began to be fearful of something serious, and I was applied to through the recommendation of some of my friends. The disease had now extended to the soft palate and down the throat so as to cut off all chance of surgical interference, and soon after reached the vocal chords and resulted in a horrible death. In all probability if this case had been diagnosed early, a surgical operation of no very severe character would have removed the disease altogether, and a valuable life would have been saved. Similar cases are not very rare, to say nothing of the thousands of cases of neuralgia that are directly due to want of knowledge and skill on the part of operating dentists, and that wear out, as it were, these hapless victims. Now, the practice of a competent dentist anywhere, is more than half made up of cases that have been the victims of mal-practice, and many cases that would have been comparatively simple and not very expensive, if properly attended to at first, become the most difficult and complicated and expensive cases that ever fall into his hands. Not only are the people of Iowa, and indeed of every other State of equal population, actually

worse than robbed of probably at least a quarter of a million a year, but many diseased conditions of the mouth resulting from these mal-practices are capable of being transmitted to offspring, and other generations will suffer for these enormities. This is by far too serious a subject to be lightly considered, but every dentist who advocates the passage of this law must be guided by a higher motive than pecuniary considerations can furnish him, for although a thousand philanthropic considerations might prompt him to give it his support, still he may rest assured that pecuniarily he will be the last one whom it will benefit. J.

From the Canada Journal of Dental Science.

THE QUEBEC LICENSE.

By the 30th of next March, every dentist in the Province of Quebec is required by law to be in possession of the license to practice; and any dentist continuing to practice after that date, without holding such license, whether he has been in practice twenty years or twenty days, will be liable to summary conviction, a fine of $100 and costs, and if necessity arises, distress of goods, or imprisonment. It is well, in the beginning, to remember that the Dental Act of Incorporation is as positively a law, and as much intended to be enforced, as any other Act, special or otherwise, on the statute book.

We do not intend to discuss the question, whether or not the profession should be incorporated. That has been discussed to death, and is still a matter of opinion, just as much as whether or not a murderer should be hung, or whether or not there should be any legislation for anything. However, the feeling in favor of dental legislation is fast becoming wide spread, even among our republican neighbors, where they boast of the genius of their free institutions; and the results everywhere, so far, have proved of immense advantage to the profession and the general public.

To those actually quacks, or disposed to be, any law restrict-

ing liberty to charlatanism, is just as opprobrious as the law against larceny to a thief. The time has gone by forever when we may expect to reason or persuade such parties into change of conduct; though, we believe there is more hope of a Jack Sheppard than a Crawcour, any day. The theory of gentle persuasion, and mild, lovable logic, is all sentimental moon-shine with such men, and just as likely to accomplish the desired end as the efforts of the impostor Mahomet to move the mountain. We believe in severe measures for criminals out of jail as well as convicts inside, and have little sympathy with the principle of elevating or converting arrant dental quacks by any other means than that of legislative rigor judiciously and firmly applied. Too cunning to meet us face to face in our Associations, they are sure to be brought to terms by just such means as are now within the jurisdiction of the Board of Examiners of Ontario and Quebec. The objects of dental legislation must surely commend them to every intelligent citizen who believes that if it is proper to protect society from imposition in matters of trade and business, of which they know something, and can use their own judgment, it is even more proper and necessary, in matters of which they are ignorant. There are few intelligent persons who are not aware of human disfigurement and in some cases destruction of life possible by dental quackery, working, as its professors do, on the human body, and daily using deadly poisons, such as arsenic, morphia, &c., and having full liberty to administer dangerous anæsthetics, a few inhalations of which to one of unsound constitution, have in many cases caused immediate death. Is the protection of one's pocket of more account in the eyes of the law, than health, and life itself?

A couple of papers in Montreal, the editors of which are something like two dogs howling at the moon—one begins and the other takes up the strain—recently undertook to censure the Quebec Board of Examiners and condemn the principle of dental incorporation *in toto*. Upon inquiry, we found that a notorious quack had pulled the wires, and had actually made them both believe black to be white. Such dodges were tried in Ontario, and with every other resource the Ontario quacks could muster,

but the phalanx of earnest men who fought for legislation there bore down all before them; and the malcontents had a fate something like that of the Black Mousquetaire,

"Who went down with a groan and a frown,
And a hole in his small clothes the size of a crown."

The Ontario malcontents were ten times more numerous than those in Quebec. Not a respectable dentist sympathizes or sides with either. The moral is clear.

While we are sure that the Quebec Board will use their powers judiciously, and endeavor to meet the respective merits and circumstances of applicants for license, we are also sure there will be no two interpretations or applications of the law, and that quackery will not be left a leg to stand on.

W. G. B.

THE CINCINNATI MEDICAL REPERTORY.

This Journal makes its appearance at the commencement of its third volume with an increase of sixteen pages of reading matter, and with its usual variety of editorials, communications, and judiciously selected articles, making altogether a very readable and instructive Journal of Medicine. The first article, the "Introductory to Dr. Bartholomew's Course on Pathology at the Cincinnati Hospital, delivered Dec. 3, 1869," gives a somewhat hasty résumé of various doctrines upon mooted pathological questions, glancing at the views of Virchow, Rokitansky, Claude Bernard, Beale, Cohnheim, von Recklinhausen and others, and takes occasion to draw attention to the fact that pathological doctrines often change, and that pathologists themselves differ, and closes with the following paragraph:

If we are wise we will not unreservedly commit ourselves to any new doctrine however, specious; but, informing ourselves fully of its details, *will await* its confirmation or rejection in the discoveries of the future.

The address gives a very fair summary of the views of the various antagonizing schools in Europe, and is by no means devoid of interest, but we would have been better pleased with the

advice given to the class at its close, if the lecturer had advised the students to "turn up something" themselves, rather than to wait for something "to turn up," and then appropriate it.

The article upon Physical Culture in Literary Institutions, is replete with valuable suggestions and statistical information that should be heeded by all who have entrusted to them the care and education of the young; and in the coming years, when no respectable Institution will be found reckless enough to neglect physical culture whilst the process of mental cultivation is being carried on, Prof. Stearns will be remembered with gratitude, and will receive that mead of praise that belongs to him as the most active of the pioneers in this much needed reform.

Upon page 20 we have a history of experiments tried by Dr. Wm. A. Hammond, of New York, instituted for the purpose of determining the function of the cerebellum. The conclusions arrived at by the experimentor do not accord with the doctrines most generally taught in the schools for the last twenty years, and which attributes to the cerebellum the function of "co-ordinating the different voluntary movements." The author concludes from his experiments that the function of the cerebellum does not differ essentially from that of the cerebrum, and consequently that it acts only as an adjuvant to the ordinary cerebral functions.

This difference in conclusions, however, has not been arrived at on account of any marked difference in the immediate results of experiments, but principally by a different interpretation of the phenomena presented, the method of investigation pursued corresponding in all essential particulars with nearly all experimenters, from the time of Flourens to the present day.

The first conclusion to which Dr. Hammond arrives, is that the consequences of removal of the cerebellum, if the animal survives the immediate effects of the operation, are not enduring.

Dalton remarks "that birds which have lost a large part of their power of co-ordination from injury of the cerebellum *may recover this power in process of time.*"

Carpenter says, "that Hertwig agrees with Flourens," and further mentions, "that if the mutilation of the cerebellum have been partial only, its function is in a great degree restored."

This conclusion then does not differ materially from the conclusions arrived at and published long ago, by other experimenters.

The second conclusion arrived at, is clearly stated as follows: The entire removal of the cerebellum from some animals does not, apparently, interfere in the slightest degree, even for a moment, with the regularity and order of their movements. The author designates snakes, lizards, turtles and some varieties of fish which are not affected by the loss of the cerebellum.

Carpenter states, "that animals, like the vermiform fishes and some other varieties, have a cerebellum so small as to be scarcely discernible, and that their motions are of a reflex character."

"The frog," Dalton remarks, "whose motions are exceedingly simple in character, has for a cerebellum, only a thin narrow ribbon of nervous matter, stretched across the upper part of the fourth ventricle."

Now it is evident, at once, that in those classes of animals where the motions are almost or entirely reflex in their character, the removal of the cerebellum would not be attended with those disturbances of the co-ordinating powers which is observed in animals whose motions result from much more varied and complicated muscular contractions. No new principle, therefore, is enunciated in the second *conclusion.*

The third conclusion, which states that "the disorders of movement which result in birds and animals immediately after injury of the cerebellum, is not due to any loss of co-ordinating power, but is the result of vertigo,"—is, to say the least of it, founded upon a rather frail basis, as the evidence adduced in its support is derived from observing certain phenomena in pigeons, which seem to indicate that they have a vertiginous sensation, and as it is not always easy to interpret the actions of birds with any great degree of certainty, it will at once be seen, that no great weight can be attached to the apparent vertigo, which, even if demonstrated to be present, still might exist even if there was also a loss of the co-ordinating powers.

As to the fourth and fifth conclusions to which the author arrives, we would only remark, that they do not accord with obser-

vations of Andral, Flourens and others, and will require confirmation from other quarters before they will be considered sufficiently well established to serve as the foundation for a new physiological doctrine.

In an article from the Western Journal of Medicine, upon page 29 of the Repertory, we find a report of cases of whooping cough, treated by Dr. B. S. Woodworth with belladonna and a decoction of chestnut leaves, which strongly corroborates the experiments of Brown-Séquard and others, and bears direct testimony to the great value of these remedial agents in this disease. Many other articles of interest embellish the pages of the January No. of the Repertory, and whilst looking it over, we are forcibly reminded of the fact, that those Journals which contain the greatest number of pages, do not necessarily contain the greatest amount of reliable information.

J.

[We have received the following from a lady correspondent, and *of course* give it a place in the JOURNAL.]

IN THE DENTIST'S CHAIR.

(By "One who has been there.")

If there is any place which, more than another, shows what people are made of, it is this particular one. We flatter ourselves that we are made of "sterner stuff" than to shrink at any misfortune; but, alas, we find that so far from having any backbone, "we are such stuff as dreams are made of, and our little life is rounded"—no, jagged, by the *toothache.*

These are the times that try men's souls, ay, and women's too, tries them and finds them wanting; shows us so plainly, that a wayfaring man, though a fool, need not err therein, the world-wide difference between actual and imaginary bravery.

Where is that heroic courage, which we fancy ourselves to possess, as we follow some hero through deeds of daring. Fired

with enthusiasm, we picture ourselves standing on picket duty in the midnight gloom of a forest, or rushing to the "imminent deadly breach." It is sweet to die in a noble cause, and we see ourselves falling with dignity, amid the tears of our admiring and bereaved friends.

But let this lofty soul feel the tingling of a little, miserable, contemptible bit of an end of a tangle of sensation, called a nerve, a bit not more than a half inch long, and say a hair's breadth in thickness, and how it does take the nonsense out of one. Brave! Of course I'm brave, if I'm not going to be hurt. Fortitude! I've as much as other people if there's nothing to bear. Why I have stood and looked on with perfect composure while my dearest friends have had their teeth pulled; but it does make all the difference in the world as to which is getting hurt.

But you screw up that most slippery article, your courage, till you think you have it at the sticking place. For weeks you say to yourself "Well, I really ought to go to the dentist's." Then your virtuous resolution rises a notch higher, and you determine to go; and you hug yourself in admiration of so much bravery and dont go, satisfied to let the matter rest there till some worse twinge than ordinary carries you bodily to the office, and there you are, fairly in his clutches and not to be released till you have paid to the uttermost in suffering.

Such is the hardness of a human heart, that the dentist actually meets you smiling, he will rub his hands and say, "It's a fine morning," or some other heedless speech. Dentists ought to be reformed. They should be solemn and sympathizing as undertakers. Hung be the heavens with black, when I am compelled to approach their hearts, and I would have them attired in funereal suits; let them also have a white handkerchief with a deep border, (possibly, mourning on the edge) visible from the pocket, and let them pull it out and drop a tear or two when their patient's sufferings become too affecting. But as the world is now, we have mourned unto them and they have *not lamented*. They smile at your agony and have you into the chair. There you are, and your soul sinks into your very boot-heels. You desire to retain some vestige of self-respect, and your friends have

thought you to possess a strong will, otherwise no power on earth would make you open your mouth.

It is a startling fact, that pain hurts every single, solitary human being in this world, more than it does any other human being, and by consequence, it hurts you worse than any other. Your teeth are twice as sensitive as anybody else's; the nerve is particularly touchy; nay, the very roots grow round the jaw, so that it is impossible almost to pull them. "Hinc illæ lachrymæ."

Then the dentist begins. He has to ascertain how badly he can hurt you with impunity. You clutch the chair apprehensively, with every muscle and nerve in your body at full tension, while he pokes and cuts around. You are about settling down that it is not so bad as you had feared, your nerves relax, and you think possibly there may be a man of feeling in the profession, when in a second, he *feels* for you and finds you too. You are pierced to the very soul; exquisite pain seems to dart to the roots of your being. The tears come, and when you are sufficiently recovered to look about, your dentist remarks in the most commonplace manner: "I thought so,—nerve's exposed." Then doth he set himself with much cunning and malice to kill the nerve. He actually lays his sacrilegious hand on the infinitely fine cobweb of a telegraph, by which communication is carried on in your system, and destroys one of the outposts of sensation. In the mean time you muse, whether it is right, thus to destroy what seems such a particularly near part of yourself. But reflecting what a rebellious member it has been, the nights you have sat up to experience all it could bring to bear upon you, you decide to let it go.

But not a thought of hesitation has filled your dentist's mind, and with a little medicine, which seems to turn your head round and round and your tooth inside out, and bore into its very roots, he lets you go. A sadder and a wiser woman you arise, with the distinct consciousness, that your dentist thinks you a very weak sister, not half so strong to endure as Miss So-and-so, who could sit down any morning and have half the teeth in her head pulled out, and never whimper. Not only are you mortified for yourself, but because you have brought shame on your half of the

human race. Women are such cry-babies, and you who were thought strong-minded are among the worst.

But on inquiring, I hope you will meet the same delightful response that I did, from a dentist, whom I have ever after considered a gentleman and a scholar. Thus it was: "Women bear pain a great deal better than men." Comforted not a little by this reflection you leave the office, saying, like the silly fly of our childhood:

"And bidding you good morning now, I'll call another day,"

but mentally resolving never to visit that scene again. But soon, alas, this silly little fly comes slowly, unwillingly creeping back, finds itself "within the little parlor" and "in the little den," taking another turn with the tooth.

Oh! the cruel uncertainty of not knowing whether it will hurt, or what the dentist is doing; and the delight of finding the nerve dead. The communication is cut and you are happy.

Now let the dentist do his worst. He may dig, and cut, and file, and drill, and mallet, and what care you? You sit in bliss and retire elated. Next to the satisfaction of a good conscience is that of a good plug in the tooth. You relax the severity of your former judgements. A dentist is undoubtedly a "man and a brother." You shake hands without a spark of malice in your soul. Let us hope that you place the fee promptly in his possession, think of him gratefully, and spread the praises of his skill, consideration and faithfulness wherever you have opportunity.

WESTON'S FLASK.

Dr. Weston, the inventor of the metal bearing his name, writes me that he has invented a *flask*, which will greatly facilitate the casting of dental plates made of his metal. They will soon be in the market. CHASE.

A PIONEER FILLING.

Extracted for Capt. Geo. Cole, 1st bicuspid, a tooth filled by Dr. B. B. Brown, in November, 1834—filling perfect.

SOL. HORINE.

Potosi, Dec. 17.

GOLD FOILS.

I have been using Nos. 20 and 60 gold foil, manufactured by R. S. Williams, New York, and have found it *very* soft and also *very* adhesive.

Manufacturers are waking up to the claims of these heavy numbers, for which the demand is rapidly increasing. Abbey & Sons, of Philadelphia, write me that they are now manufacturing Nos. 20, 30 and 60 *non*-adhesive foil. The latter would doubtless be very convenient for cylinders.

Wm. Valleau & Co., of New York, make a very excellent *adhesive* foil. I have been and am now using their No. 2, and think I have never used better.

J. M. Ney & Co., of Hartford, manufacture a foil which works remarkably well as a *non*-adhesive *before* heating it; and *after* heating as an adhesive foil. I think there is not as much difference in foils as there was formerly. I used to think that there was but one good manufacturer of gold foil in the United States. But the case is very different now. I have tried a dozen or more different ones in the last two years, and have not found a bad book.

I think Abbey & Sons still take the lead, however, for *non*-adhesive foil. Leslie, Ney, and Eakins make that which is available as adhesive or non-adhesive, equal to any other manufacturers, while Johnston, Dunlevy, Williams, and Valleau are unrivalled in that which is purely *adhesive*. The Dental Profession may certainly congratulate itself on being provided so abundantly with such superior foils as are now offered it. CHASE.

DEATH REPORT.

For Five Large Cities for the Month of January, 1870.

New Orleans, . .	population	200,000,	deaths 534
Cincinnati, . . .	"	230,000,	" 354
Boston, ...	"	240,000,	" 480
St. Louis, ...	"	285,000,	" 547
Chicago, ...	"	290,000,	" 482

Small-Pox has swelled the number of deaths in this city for the last three months. CHASE.

The Missouri Dental Journal.

A MONTHLY RECORD OF THE SCIENCE.

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ADDRESS.

Delivered before the St. Louis Microscopical Society at the annual installation of Officers, by H. C. GILL, M. D., President of the Society.

GENTLEMEN: It is with feelings of thankfulness and obligation to you that I appear in this relation. It is with more than satisfaction that this mark of esteem from my professional friends is acknowledged. And while accepting the position, it seems to me that the proof of worthiness for such consideration is more a question for the future than the past.

The object for which we assemble is mutual edification and advancement in science, especially those branches of science which are more intimately connected with medicine in one or another of its departments.

We are united for the purpose of examining for ourselves the substantial world, invisible to the unaided eye; to obtain, if possible, clear views of the processes of life and death, or the changes of substances, whether organized or inorganic, which occur under vital or chemical influences; to learn to produce, to modify or to prevent such changes, as well as merely to recognize them when already completed.

It would seem that the original design was, not that any one should perform so much, as that each one should do something; but as some accomplish little or nothing, it devolves on others to

effect the more. It is a truth, that the fields of labor have been sufficiently wide and numerous for all; but the supineness of many has raised up for them superiors, who should have been only honorable competitors. We desire not to linger by the way while others are advancing the hill of science; but we desire to acquire, and to aid others in acquiring, knowledge that may make us useful, honorable and good.

> "All true knowledge has its origin divine,
> For all that expands must of necessity refine."

We can scarcely realize the great advancement in real knowledge, until we come to consider for a moment the means now at our disposal for obtaining facts, compared with those in use centuries ago. If the ancients used a hollow glass globe filled with water for the purpose of enlarging an object, and we a lens magnifying many thousand times, would we be excusable in not knowing much more than they? We should rejoice and feel grateful to the memories of those who did so much, and a just pride that we are the cotemporaries of men who have done and are doing such laudable work for our pleasure, knowledge, comfort, and benefit. Such men as Beale of London, Robin of Paris, Virchow and Cohnheim of Germany, are, in microscopy, an honor to the age.

What should we know of the diseases of the kidney without the microscope? Rather, what should we know of the anatomy of that organ without that instrument? Comparatively little. The same is true of many of the members of our bodies.

What should we know of the structure of the teeth, of their minute dentinal tubes with their soft contents? We might suppose the tooth dead when the central nerve and artery were destroyed, and decide on its immediate removal; whereas, observation and practice have proven differently: the tooth is preserved, and health promoted.

Among the more recent discoveries in disease is the *trichina spiralis*, that minute animal which has caused ravages in some parts of Europe. Without the microscope, the cause of the disease would not have been understood; and as a consequence the

preventive means, which have proved so successful, could not have been applied. In the same category, though less important, is the measly meat and tape-worm.

Very many of the cutaneous diseases are caused by either animal or vegetable parasites entirely invisible to the naked eye. But being understood, their remedy in most cases becomes easy, and their extension prevented.

The *inflammatory process* and its formative and retrogressive sequences, formerly so completely obscure, is yielding rapidly, thanks to the Israelite Cohnheim and other investigators of the present age, to the inquisitive microscopist.

It is not enough that we have a theoretical knowledge of the minute structure of organs, tissues, formations, substances; and of the quantity, quality and relation of the component parts; and of the form, size, and changes which may be seen, watched and compared, in organized bodies and in the unorganized. We must see them for ourselves. The eye must become familiar with the sight, as the ear of the musician with sound, or as does the physician who would examine the physical signs of the lungs in disease and in health. As well might the navigator, the astronomer, the surveyor, or the engineer, claim a knowledge of his science by only studying books and instruments. Observation, careful and frequent, is essential in these : so is it in microscopy. It is work that is needed to acquire knowledge, that possession which belongs not to royalty, that comes not upon the wings of the wind, is not inherited, but which is the result of labor long and faithful, and is a reward greater than the toil.

They who may have means to purchase the most costly instruments and books, and have leisure, being without occupation, are not the most likely to attain unto the highest position in the exact sciences. None are debarred; all may enter the circle on condition of being faithful servants; idlers never can purchase a card of entry.

With a plain instrument, a few reagents and apparatus, all costing but a small sum, one may accomplish in a few years more than he could have hoped. But to him who has neither the time nor the inclination, nor yet that essential, determination to

work much, I would say, "Better not take up the subject at all." He will certainly bring discredit on himself as an observer, and also on microscopy as a science.

Economy of time, utilizing the odd moments, systematizing study and labor, will place a person in a position to accomplish much, almost anything he may undertake. Materials for observation can be obtained anywhere, and at any time; and few things are more important for the eye to recognize than particles of dust and dirt which fly about in the air—*foreign bodies*,—in order to exclude them from that which may be especially under examination. The solid organs—the kidney and liver, as well as muscles, nerves, cartilage, bone, epidermic and epithelial cells—are within the reach of every one.

In fact, time may be taken, material found, the means obtained, and the practical knowledge acquired to make every medical man a fair observer with the microscope, and able to make the diagnosis for himself in many otherwise difficult and obscure cases.

Among the eminent of our profession, names mentioned, and many more which might be cited, both foreign and in our own country, are men of intense application for years, yes, for nearly a life-time; and the late distinguished Velpeau, in speaking of success, said, "Work always."

To those who speak or think lightly of the microscope, in its relations to medicine, we have only to say, "None are so blind as those who will not see."

If the natural eye is of immense value in acquiring knowledge, sight increased in power a thousand times must be better.

Whilst nothing which has been said may have been unknown to you, gentlemen, yet it is fitting at times to take a broad general view of the subject we may have in hand. When selecting an author, let it be a master in his department; and when we take up a subject, let us, by each other's help, make ourselves masters of it. To those beginning, I can confidently recommend Beale's works, "How to Work with the Microscope," and especially "The Microscope in Medicine."

Above all, may we be united in a determination to make

"The Microscopical Society of St. Louis" interesting, instructive, and successful. Again thanking you for this manifestation of esteem, I promise to work faithfully with you for the advancement of the interests of this Society.

1117 Pine Street, St. Louis.

[*From the Boston Journal of Chemistry.*]

HYDRATE OF CHLORAL.

The distinguished Dr. W. A. Hammond publishes in the *New York Medical Journal*, the following interesting and important article upon chloral. Although it is long, we feel that our readers will thank us for placing it before them: —

All the experiments which have been performed with the hydrate of chloral, whether upon man or the lower animals, go to show that it is a powerful hypnotic; but there is a difference as to whether the first effect is not the very reverse of sedative. Demarquay has shown, by *post mortem* examinations, that it produces congestion of the brain and its membranes; but his researches are, in this respect at least, not very precise, for they do not touch upon the point of different effects being produced by different doses; nor was any accurate examination of the state of the cerebral circulation made during life. My first object, therefore, was to determine the influence of hydrate of chloral over the cerebral circulation.

Experiment. — I examined very carefully with the ophthalmoscope, the retinæ of a rabbit, and ascertained that they were in a normal condition. I then injected seven grains of the hydrate of chloral, dissolved in water, into the cellular tissue, and two minutes afterwards made another ophthalmoscopic examination. The vessels were decidedly increased in size, and several that were previously invisible made their appearance. The pulse and respirations were both increased in fre-

quency. At the end of five minutes another retinal examination showed increased congestion, not only of the retinæ, but of the optic disks. The pupils were largely dilated. After seven minutes had elapsed, the animal exhibited signs of drowsiness. The pupils began to contract; and examination with the ophthalmoscope showed that the retinal congestion was greatly lessened. At the end of ten minutes sleep was profound. The pupils were strongly contracted; the temperature had fallen four degrees; the action of the heart was less frequent; the respirations were diminished, and the retinæ were of a pale pink color, with but two or three very minute veins visible. At the end of two hours the sleep was very deep; the respirations were feeble and slow; the ears were cold, and the retinæ were pale and exsanguined. After nine hours and twenty minutes the animal was found awake, and in a perfect normal condition as regards temperature, circulation, respiration, and the condition of the retinæ.

This experiment was repeated three times, and always with similar results.

Now, as is well known, the ophthalmoscopical examination of the retinæ affords very exact indications as to the condition of the cerebral circulation; but by means of an instrument devised, though in somewhat different forms, by Dr. Weir Mitchell and myself, independently of each other, we are enabled to determine the point directly. This instrument, which I venture to call the cephalo-hæmometer, consists of a brass tube which is screwed into the opening made into the skull with a trephine. The lower end of the tube, which rests upon the dura mater, is closed with a very thin piece of india rubber cloth; the upper end of the tube is closed with a brass cap, into which a glass tube is inserted. To this tube a scale is attached and the brass tube is filled with colored water, so that when it is screwed into the skull, and the end touches the dura mater, the level of the liquid stands at zero. When the apparatus is in place and properly adjusted, it is very evident that any increase in the amount of blood circulating through the brain will cause the dura mater to press with increased force against the rubber membrane, and will thus cause the liquid to rise in the glass tube. Any dimi-

nution of the circulating fluid will cause the level of the liquid to fall. We have thus a very accurate means of measuring the cerebral hæmostatic pressure.

Experiment. — I operated on a rabbit with a small trephine, and inserted a cephalo-hæmometer. As soon as the instrument was *in situ*, I injected seven grains of hydrate of chloral into the cellular tissue. In one minute and ten seconds the fluid began to rise in the tube, and in three minutes it stood at a point an inch higher than the normal level. After five minutes it was an inch and seven-eighths higher. This was the maximum point. It now began to fall steadily, and in two minutes and fifteen seconds reached the zero, the point from which it had started. Coincident with its further depression, drowsiness came on, until when the level was about an inch below the zero, the condition of sleep was well established. The fluid continued to fall till the level was two inches and-a-half below the zero, which point was reached in thirty-two minutes after the injection was made. It remained stationary about an hour longer, and then fell about a quarter of an inch lower. It was not further depressed. After the lapse of seven hours and forty minutes it began to rise, and with this change the respiration, which had been feeble, became stronger and more rapid, and the animal exhibited signs of returning animation. At the end of nine hours and twenty minutes the animal awoke, and the level of the liquid, which at the time was about half an inch below the zero, rose rapidly to the original point. It continued to rise for a few minutes, but gradually fell again to the zero. This experiment was repeated on three other rabbits, and similar results elicited.

Up to this time, it will be observed, that what may be called large doses for rabbits had been employed. Desirous of ascertaining the effects of a small dose, I performed the following experiment: —

Experiment. — Having adjusted the cephalo-hæmometer to the skull of a large rabbit, I injected under the skin a solution containing one grain of the hydrate of chloral. The water in the tube began to rise in a minute and forty seconds, and at the

end of five minutes was three-eighths of an inch above the zero. The animal continued lively, and the pupils were dilated. The respiration and pulse were both accelerated. In half an hour the level of the liquid was at its highest — about three-quarters of an inch above the starting point. It now began to fall slowly, and in fourteen minutes was at the zero. During the whole time of the experiment the animal showed no signs of sleep, but was, on the contrary, unusually active. Ophthalmoscopic examination revealed the existence of a state of congestion of the retinæ, which lasted till the liquid in the cephalo-hæmometer had fallen to its original point. The experiment was repeated, with similar results, on two other rabbits.

Demarquay found as one of the results of his investigations, that the hydrate of chloral in large doses produced continued congestion of the cerebral blood vessels of the rabbits to which he administered it. His observations were made *post mortem*, and cannot, therefore, be considered as altogether reliable. The congestion was in all probability, caused after death.

To be still further assured upon that point, I performed the following experiment: —

Experiment. — I removed from a large rabbit nearly one-half of the cranium, and opening the dura mater, laid bare the cerebrum and its membranes. I had thus almost the whole superior and external surface of one hemisphere exposed to view. I now injected one grain of chloral into the cellular tissue. In about two minutes the surface became redder and the vessels larger. I now injected five grains. The surface of the brain became of a dark blue color, and protruded through the opening in the skull. In something less than five minutes, however, a change ensued. The color gradually changed to red, the brain sunk again below the surface of the opening, and a state of anæmia ensued. With these changes the animal fell asleep. At the end of half an hour the surface of the brain was colorless, and no blood vessel could be perceived. After seven hours and thirty-three minutes from the first injection, the brain again resumed a pale red color, and the animal awoke.

I regard these experiments as showing conclusively that the first effect of hydrate of chloral is to cause congestion of the cerebral blood vessels, and that subsequently it induced the opposite condition. With a small dose, this latter effect is not reached, congestion only being produced.

[*To be continued.*]

[*From the Boston Medical Journal.*]

EXTRACT FROM THE ADDRESS OF DR. HITCHCOCK.

Delivered before the Massachusetts Medical Society.

The errors and superstitions of both Christianity and the practice of medicine are *human*, and are not in any sense, as before stated, an integral part of their nature; and, though sometimes obscuring their lustre, do not permanently tarnish their purity, or create a lasting doubt of their divine origin. Errors and follies in religion and medicine, like counterfeits, which prove the existence of a genuine coin, will be always more or less current in the world's market, so long as men love the pleasure of being cheated. One form of superstition and imposition displaces another, like Satan casting out Satan; or sometimes "seven worse spirits" rap in concert, to empty and sweep the victim's house and garnish their own pockets. In contravention of all the truths and principles of Christianity and Science, religious and medical delusions, superstitions and crimes, make a dark record in the page of history. Nor is that dark record yet finished. The foul drama is even now passing; the curtain has not dropped.

This may seem a strange anomaly in the midst of the self-congratulations of the age claiming superior knowledge, liberty and Christian civilization. *Clairvoyance and spiritualism*, or the practice of invoking the souls of the dead to cure the bodies and guide the morals of the living; *inebriety as a sin and a disease*;

and *pre-infanticide*, not an imitation, but a forestalling of the work of Herod, together making a tripod of crime which in this nineteenth century not only permeates with leprous poison the heart of American society, but already, like a huge melanotic cancer, deforms its body, and threatens to make it loathsome to sight and touch.

Scarcely a street in our cities, or hamlet in this commonwealth, but echoes the mumbling jargon of clairvoyants and spiritualists in their religious and medical contortions and pretensions.

They have revived the old Alexandrine or Sybilline *ecstacy*, without its genius or inspiration, promising its imbecile believers a superhuman science in the realm of mind, as well as matter, on condition of themselves first losing all consciousness, thought, liberty, memory, all that constitutes man an intelligent moral being.

They claim to converse with the spirits of the dead, and evoke their presence and teachings for the good, or ill, of the deluded victims of their jugglery. This is one of the results of an ignorant or dishonest departure from revealed and scientific truth.

Pascal once said that "whosoever professed to become an angel became a beast;" a truth often and shamefully verified by the clairvoyants, spiritualists and free-lovers, of the present generation of impostors in religion and medicine. Cicero marvelled at the imperturbable gravity and mock honesty of the Roman augurs and soothsayers. He understood and satirized the deception.

In this modern age, so called, good Christian people look with amazing faith upon the contortions and cabalistic mutterings of the clairvoyant at the bedside of the sick, and marvel at the supernatural wisdom and skill of the performers.

The first Napoleon, for *reasons of state*, with an impressive air of sanctity, alternately played the Mohammedan, the Jew, the Catholic, or the Protestant, as best suited the place or the occasion; while these juggling impostors, many of whom are Napoleons in ubiquity and cunning, have only *reasons of pocket* as their motive power. The most astonishing and deplorable feature in reference to the popular existence and practice of these delu-

sions in this commonwealth, is the fact of the tolerance, nay the encouragement and patronage of them, by people who claim to be intelligent Christians.

The gyrations and gibberish talk of these modern impostors as they pretend to evoke lessons in religion, morals and medicine, from the soul of some sage or physician, dead centuries ago, are witnessed, believed in, and adopted, by some of our modern Christians, who very properly shed tears of pious grief, and testify to the sincerity of their sorrow, by gifts of money to send teachers and missionaries to convert the Hottentots and Feejeans from precisely the same fetish rites and heathen incantations.

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Revelation has sometimes been worse used by its friends than by its professed foes in any of the attempts to show its antagonism to Science. But with Chalmers and Hugh Miller, with Simpson and Agassiz, and the late President of Amherst College, reinforced by a galaxy of minds in both professions who have sanctioned the indissoluble banns between Science and Religion, we have nothing to fear. None but dwarfed or corrupt minds in either profession will in this age attempt to repel or disown the truths of science, or make the futile attempt to assail the citadel of Christianity. The alliance between Christianity and medical science is complete; time and trial only strengthen it; and now, in spite of the occasional spasms of skeptics and wits, all sincere friends of Christianity and medical science, rejecting their parasitic follies and inanities, may give each other the hand of fellowship, and work in concert to heal the sick, to dissipate mental darkness, to encourage desponding hearts, and reform and lift up burdened characters. Notwithstanding the discouragements which the grievous follies and errors that formerly, and even now occasionally, despoil the development and application of religious and scientific truth, the gleam of their grace and beauty will never fail to shine and warm through all the fitful darkness. This man or that in either profession may be deceived; this or that class of men may dream fantastic or poisonous dreams and play off cruel falsehoods upon the race, but all men and all generations will not be thus deluded. Somewhere in the world

and in many minds the great primal God-given truths, which are the origin and power of both professions, emancipated from error, will ever live and expand to bless and perfect humanity.

ALVEOLAR ABSCESS.

Its Characteristics, Pathology, Etiology, and the Philosophy of its Treatment.

By H. Judd, M. D., D. D. S., Professor of the Institutes of Dental Surgery in the Missouri Dental College.

The various articles which have appeared upon this subject in the journals of the last few years, have done much to correct the practice of the profession in the treatment of this disease, but many things connected with this subject have not been as thoroughly elucidated as its importance demands.

Gum-boils, as they are usually denominated by the patients themselves, are too common and familiar to every dental practitioner to require any extended or elaborate description, so far as their external characteristics are concerned, but it would be undoubtedly of interest to the profession, and would also conduce to a more philosophical treatment still, if the pathological conditions could be as clearly understood by the practitioner as are the external manifestations.

We are as well aware as any one else can be of the magnitude of the labor that one must undertake in order to perform, with even a tolerable degree of accuracy, the task of bringing together the facts that are known in relation to this subject, and so arranging and comparing them that the greatest amount of light possible should be shed upon the pathology of this affection, and we approach the subject with reluctance, and would gladly assign it to the care of abler hands; but others also seem to shrink from making such an effort, and in order that the attention of the working members of the profession may at least be pointed to this

field of investigation, we propose to jot down, at intervals, for the consideration of our readers, our thoughts and speculations, and the result of investigations upon this subject.

When we leave the domain that is known, however, and treat of hypotheses instead, we shall endeavor to make it plain to every reader where the division begins, that no one may be misled by any speculations that may be indulged in, though we do not propose to put forward any hypotheses which do not seem to be warranted as deducible from that which is already established.

It will be at once apparent that we have to encounter at the very threshold of our pathological inquiry, grave questions which have met the medical inquirer in all ages of the world—those questions which relate to inflammatory action.

Nothing can make the absolute necessity of a complete medical education for a dental practitioner more apparent, than the fact that the treatment of inflammation in its various forms and stages daily devolves upon him, as it does upon the practitioner of general medicine, and that the study of inflammation yet offers the widest and most fruitful field for cultivation which can be found in the whole range of medical science.

The descriptions of alveolar abscess found in many of our text books are well written and give a very correct history of the external characteristics of this disease, which renders it unnecessary to spend much time upon this branch of the subject.

A discharge of pus from an opening upon the gum is the most common characteristic of a gum-boil. The discharge may be constant, the opening being persistent, or it may be intermittent, the opening closing after each paroxysmal discharge, and opening as often as the accumulation of pus necessitates evacuation. A fine probe passed into the opening follows, in many cases, a canal reaching to the apex of the fang of a tooth. The opening usually is located upon the surface of the mucous membrane, between a point immediately over the apex of the fang and the margin of the gum, but sometimes the pus makes its way through the alveolar process and soft tissues directly outwards, in which case the opening is directly over the apex of the

root, and in cases where the fangs of the teeth extend into the alveoli, beyond the point where the mucous membranes of the lips and cheeks are reflected upon the maxillary bones, the pus finds its way out upon the surface of the face, or perhaps burrowing beneath the fasciæ, muscles or skin, makes its way far down the neck before it finds an outlet. In some cases the opening is at the margin of the gum, the pus having found its way to the surface along the root of the tooth, and in some few cases the abscess points towards the antrum and discharges its contents into that cavity. In a few cases the abscess is not located at the apex of a root but upon the side, or it may be between the fangs of a molar, in which case it usually opens by the side of the root. In other cases the pus finds exit through the pulp canal. Again, an abscess may be formed and finally disappear without an external opening.

To be Continued.

Operative and Surgical Dentistry.

FILLING TEETH.

CASE I. — PREPARATION OF THE CAVITY.

The right upper 2d molar has a shade of discoloration, showing on the posterior portion of its triturating surface. The tooth lies closely to the 3d molar and has no appearance of decay near the grinding surface. The teeth are to be separated now with a wedge nearer the gum, and a delicate excavator does not discover a cavity near the grinding surface, but softened enamel is perceived near the cervical portion, cutting like hard chalk.

The patient's mouth is small, if it was larger I would cut a dovetailed slot, with small hoes and hatchets, from the *buccal* surface of the tooth, to the cavity. But in this case the mouth is

too small for the proper manipulation of instruments, and therefore I proceed in the following manner:

With a crescent drill make a canal from the *grinding* surface of the tooth as directly upwards towards the cavity as possible. It must be *very* near the posterior approximal surface. Near the cervical portion the drill enters the softened dentine. I now cut out the thin portion of dentos between the canal which I have made and the posterior approximal surface of the tooth, leaving an open canal, a section of which when finished must exhibit a "dovetail."

This open canal must correspond in diameter to that of the cavity of decay.

TO KEEP THE CAVITY DRY.

Wedge, to press back the gum at the cervical portion, or a bit of spunk crowded between the teeth at this point. A bit of spunk an inch square over the parotid duct of the same side held by a compressor. Sheet rubber laid over the lips and under the teeth as far back as convenient; over which is a thin white napkin to reflect light into the cavity; the gold contained in the plugging pliers will not get wet in being introduced, by any efforts of the patient in swallowing.

INSERTING THE GOLD.

Make two cylinders of soft, unadhesive gold, whose diameter shall each be a little more than half that of the cavity, and whose length shall be a little more than its antero-posterior diameter. Place one of these cylinders within the cavity so as to allow one end to press against the adjoining tooth. With a foot-shaped plugger carry this cylinder about half way to the bottom of the cavity, then press it sidewise and carry the other cylinder to its side. With a little larger foot carry the whole of the gold *home*, and mallet it down. It can hardly be compacted too much. If well done the margin of the cavity nearest the alveolar process will be covered with gold and thoroughly protected. If the cylinders press well against the adjoining tooth they will remain *in situ* while more gold is added to them.

Add to the gold surface now made a thin layer of Morgan's

plastic gold and condense thoroughly with very shallow and sharp instruments. Now cut up No. 30 into narrow and short strips, and fill the remainder of the cavity, all the time keeping the plug against the adjoining tooth solidly. If this is done the teeth will be separated considerably by the time the operation is through. When near the surface use No. 60 in small square pieces and very small pointed pluggers. The gold may now be filed out which is pressed between the teeth and thoroughly polished.

POLISHING.

No plug can be well polished which is not dense. It must be uniformly dense near the surface. Deep serrated pluggers must not be used if a good surface is desired. It is impossible to fill the pits or obliterate them. They may be partly closed by condensing with a small smooth point for a long time.

Bring the surface down to the desired level with burrs and scrapers. If the gold has been properly condensed, it will cut like a solid piece of coin, and appear so also under the magnifying glass after burring it.

A deceptive polish may be made by using the burnisher, but it is only a thin film of gold which is thus made smooth, and which will in a few weeks wear off and show a rough surface.

After burring and scraping the plug, use pumice stone and a stick for quite a long while. Wash off the pumice from time to time and examine the margin. Form the latter to a continuous even line if possible, with a sharp excavator, or crescent drill, and then pumice it again. Pumice stone makes an *honest* and good finish; good enough in fact for all practical purposes for plugs that are not conspicuous. But we need not grudge a few minutes with chalk after the pumice. Prepared chalk on a soft stick for grinding surfaces, and chalk on chamois for approximal ones, will give a beautiful surface in a very short time, provided it has been sufficiently pumiced. A few drops of alcohol added makes it more agreeable in the mouth.

As it is not pleasant to the patient generally, to have these powders falling on the tongue, it is very proper to place a small napkin in such a way as to catch them, while polishing.

CHASE.

(*From the Dental Cosmos.*)

ADHESIVE GOLD FOIL --- ITS DISCOVERY, HISTORY, AND USE.

By A. Westcott, M. D., D. D. S., Syracuse, N. Y.,
Formerly Professor of Operative and Mechanical Dentistry, in the Baltimore College of Dental Surgery, and late Professor in the New York College of Dental Surgery.

There is perhaps no one principle connected with dental operations of greater moment, or whose value is more universally acknowledged by the profession, than the *adhesiveness of gold*, either as foil, sponge, or however gold may be prepared, to make this principle available in filling teeth. Before this principle was discovered, the theory of making fillings permanent was, to a large extent, that they were kept in by leaving the orifice through which the gold is inserted smaller than the cavity within, and they were thus "dove-tailed" into the tooth. I have now in mind an advertisement issued *more than thirty years ago*, by a dentist who now stands at the very head of the profession, as an operator, which read substantially as follows: "I insert my fillings in such a manner that they never come out, which I do by making the cavity *inside* much larger than the orifice through which the gold is inserted, thus giving it a firm mechanical holding." Now, this was a good, frank avowal of his way and manner of operating, and showed that he was then, what he has since proved himself to be, *an honest man*. This was, moreover, a *taking* advertisement; for in a very short time this young man was doing a fine business in a small country village, where, previously, dentistry had hardly been heard of, and I have to confess that I looked upon this representation myself with no little admiration.

I have for a long time been intending to prepare a paper upon *the origin and history of adhesive gold foil*, but have been waiting for the legion who have from time to time laid claim to originality in the discovery of this great dental fact, — that gold is susceptible of adhering to itself, or of being virtually welded at

common temperatures, — to write out their respective claims, feeling that when all the rest were through, I would bring up the rear. How far or how perfectly I have been thus outflanked I shall let dates and facts speak for themselves.

In the spring of 1840, I was practicing dentistry in Homer, Cortland Co., N. Y., and ordered from T. B. Fitch, Esq., then a druggist at Syracuse, now an eminent banker of this city, and who well remembers the circumstance, an eighth ounce of gold foil by mail. It being in the days of high postage, and Mr. F. knowing that my extra pennies were few, undertook to do me the favor of economizing for me, by removing the intervening papers from between the leaves of foil. I received the foil in this way, and to my surprise, and I may well say dismay, I was wholly unable to separate the leaves of foil from each other. They had by some magic, which had never before come to my notice, literally "grown together." What was to be done? I was not only *foiled* in regard to my promised operations, but I must await the going and coming of the slow coach, the long distance of thirty miles, before I could take another step, and meanwhile writhe under the uncertainty of being able to better myself after all. More than this, I was in danger of suffering (for me) a heavy pecuniary loss, unless I could convince Mr. Fitch that the responsibility was on his shoulders, in consequence of the blunder which he had committed, in the removal of the aforesaid papers. Here was presented to my mind the triple misfortune of the probable loss of my "job," the actual loss of two or three days' time, and the possible loss of a whole eighth ounce of gold foil!

This was surely a time for meditation and reflection, and I did reflect. This may possibly provoke a smile from some reader, but it must be from some one who did not begin the world as I began it. In all this there was to me "no levity." But in my sad ruminations I did not allow myself to forget the necessity of prompt action. I immediately wrote a sharp letter to Mr. Fitch, which was not mollified with a single expression of gratitude for his well meant effort to do me a kindness, asking him immediately to replace the foil, by sending, "per first stage," another parcel,

and with the strong injunction to *leave the papers where he found them.* All this was as new to him as to me, and at once falling in with my suggestion that "there must be something wrong about the foil," he immediately wrote Mr. Barrett, of Albany, who made the foil, for an explanation. As soon as the then slow mails could bring it he received a reply from Mr. B., which he lost no time in forwarding to me, apologizing to Mr. F. for having sent him such a batch of foil, and adding that, "once in a while foil would prove *sticky*, but he never sent out such foil when he knew it," — all of which would have been very consoling to me had it accompanied the original package of foil sent me by Mr. Fitch.

But this information, "for immediate use," came too late. My reflections, ere it came, had taken another very different channel. As soon as the shock was over, I began to inquire into the probable cause of this result, and as to whether it did not present an idea which might be made available. The question soon arose, — *If gold foil might be thus virtually "welded" in a mail bag, why not in the cavity of a tooth?*

I lost no time in putting this question to a full practical test. I began my experiments by screwing together two plain surfaces of ivory, and drilling a hole at their joining, so that when taken apart one half of the hole would be in each piece. I could in this way very easily remove my filling packed into this cavity. This I did frequently, till, by hammering, and otherwise testing these fillings, I became perfectly satisfied that I could make, of any number of pieces of pellets, *one solid, integral piece* that would take and retain a polish under any circumstances; and I can here truthfully add, that the first filling in the mouth which I did with this foil, was the first perfectly polished filling that I had ever seen. Thus was my vexation turned into joy, "far more exceeding;" and before Mr. Barrett's letter reached me, which I think was in about ten days, I was ready to contract for all the "sticky" foil I could get; and the moment I got his letter, addressed to Mr. Fitch, I wrote him (B.) asking him to save all of his "sticky" foil for me; and I continued to get such foil of him, from time to time, while he remained in

business, or till Watts found a method of producing such foil with certainty and uniformity. After satisfying myself that the adhesiveness of foil could be relied upon, the next question which arose was, "What were the conditions necessary to secure it? or, on what principle was it effected?" I became satisfied that the cohesion, or adhesion, (for both these terms, for all practical purposes, are synonymous) was something more than an interknitting of particles,—it was a surface joining, and was none other than that *cohesion* exhibited by two lead bullets when two fresh cut surfaces were pressed together, the two becoming almost inseparable.

Looking upon the phenomenon as simply *co*-hesion, I at once concluded that the rule laid down in all works on natural philosophy, in order to secure cohesive attraction, must be observed, viz.: that "the particles, or bodies to be made coherent, must be brought in *actual contact.*" In other words, the foil must be positively free from *all* foreign substances. Any one will find by trying the experiment, that in the case of the lead balls, above referred to, that if he simply draw a finger over the fresh cut surfaces, it will effectually break up their otherwise strong tendency to cohere. Foil, then, even when of the "sticky" variety, must be kept perfectly free from *every* foreign substance, such as dust, soil, and especially from moisture. How frequently is the operator first notified of unseen moisture by the fact that his pellets won't adhere? And he might as well dip them into oil, as in water or saliva, if he wishes to avail himself of this quality of adhesiveness. From such facts and considerations comes the rule,—*Keep your foil positively dry during your entire operation.*

How operators have acquired prominence by submarine fillings, I have yet to learn. I have always supposed, however, that their pluggers were made of a goose quill or other *pen*, and I fancy that such is not the kind of greatness to be marred by distance. To say the least, I do not believe that a close inspection of such fillings ever produced much "enchantment." Why adhesive foil loses this quality simply by keeping, and why heating restores it, are questions which must have occurred to all.

Is not the former question chiefly answered by supposing that it absorbs moisture, and the latter, that this humidity is dissipated by the heat?

But, to return more directly to the subject of this paper: I will say that from that day till the present time I have used adhesive foil in greater or less quantities, and with various modifications, till my present practice varies very materially from my early experience and practice with such foil. My discovery of, and experiments with, adhesive foil I immediately communicated to such dentists as I chanced to meet; for it will be understood that they were not as plenty in 1840 as in 1870, and the *adhesive principle* was as little understood and practiced among themselves, as was this principle or its application to gold, in filling teeth. It will also be borne in mind, that at that time there was but one dental journal published in the United States, and that but just started. I think that the first article of mine which was ever published in a dental journal, (and this was not written for publication) was my essay on "Dental Caries," read before the American Society of Dental Surgeons, in July, 1843, and published the following September. It will thus be seen why I did not immediately *publish* the result of the *accident* above alluded to.

I very soon discovered that to work such gold foil to the best advantage I must modify my instruments, and different experiments very soon (within a few weeks) brought me to the conclusion that serrated points were, better than any others, calculated to work it with ease and dispatch, and I accordingly altered all of my pluggers to conform to this idea. These were the first set of the kind which I had ever seen or heard of. Perhaps this paper may meet the eye of some one who can ante-date me. This is certainly possible, and would in no wise detract from the originality of *my* discovery. Nor would it be the first time I have myself been caught in a similar trap. I have sent many a supposed invention to the patent office, to be told that the invention was older than him who claimed it. My communications upon this subject have hitherto been oral, partly for the reasons already given, and partly because I have never

happened to get about it. And even now, my writing this paper is about as purely accidental as was the discovery of which it treats.

But notwithstanding I have not *written* anything upon this topic, I have never failed to talk upon it with every dentist who has expressed any interest in it. My theory and practice have ever been, that no *professional* man has any right to withhold any fact or process from a professional brother, which would be useful to him, and which pertained to their common profession, nor to tie up such information by a *patent*. I have procured within the last twenty years, about thirty patents for my own inventions, but no one of them has in the remotest manner, pertained to the profession of dentistry in *any* of its branches, notwithstanding I can claim to have furnished, both to the operating room and laboratory, many things and appliances which I knew to be patentable. Indeed, the discovery about which I am now writing was a most proper subject for a very valuable patent. "Dow Jr." wrote what he called "patent sermons," but I never heard of his being a communicant in good standing in any *orthodox* church.

From 1840 to 1846, inclusive, I probably conversed with one hundred or more dentists upon the subjects of this paper, and freely communicated to each and all every fact which I now set forth. In 1846 I became connected with the Baltimore College of Dental Surgery, as Professor of Theory and Practice, and gave a lecture upon this topic before the students, in February, 1847. Having given notice to Professor Harris that I was to give such a lecture, he invited all the dentists of the city* to be present, and many of them were present. While I was discussing this special topic, if I could not discern most plainly upon the countenances of some of them the smile of derision, it was clearly that of unbelief. The "welding of gold," at common temperatures, seemed an absurd, not to say a ridiculous, doctrine.

Among the gentlemen present at that lecture, was the late

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* Baltimore.

Dr. E. Townsend, of Philadelphia, with whom I had previously conversed upon this subject, and who had expressed a deep interest in it. He expressed strong desire to see this principle demonstrated by one who had had experience in the matter, and gave me a pressing invitation to spend a day or two with him, at his house in Philadelphia, on my way home. To this I agreed, and instead of spending "a day or two," I spent a full week with him, and filled teeth each day from two to four hours. My first patient was the doctor himself. I filled a compound cavity for him, in an upper molar, in which I put nine sheets No. 4 foil, which filling he carried with him to his grave.*

During each of these sessions there were present, on his invitation, several dentists to see (to use his own language) "Dr. Westcott's new method of using gold foil." I have been a little particular in recounting these circumstances, as his reticence in regard to myself, in a paper which he read some years afterward upon this subject, might not seem to tally with these statements. I am unwilling to think that he intended to do me injustice, but simply forgot to mention my name in that connection. When I went to his office, as above mentioned, he had not a single plugger with serrated points, and he for the first time and under my directions altered several to meet this end. I doubt not that there are several gentlemen still in practice who can fully corroborate the statements made above, and if this paper should chance to meet the eye of either of them, I should be much obliged if they would communicate with me upon the subject.

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*Since the preparation of this paper, in looking over my correspondence with Dr. Townsend, I find in one of his letters, dated July 9th, 1847, the following playful allusion to this filling. In alluding to a "Mr. Lawrence," as the inventor of an appliance for holding napkins, he says: "You must recollect him as one of our party who stood over you at 'Broad Street House,' and saw you place that beautiful *door-plate* in my mouth, which still gives out its golden lustre as brightly as at first." The doctor's allusion to this filling as a "*door-plate*," not only had reference to its great size, but its covering the whole anterior surface of the first upper molar, forward of which one or more teeth had been extracted; it could be seen at a considerable distance, whenever he opened his mouth, or even in ordinary conversation.

From that day to this I have used "sticky foil," and, as I have already said, with various modifications, till my present practice varies widely from that first adopted with such foil. Now, for the sake of comparing notes with other practitioners, or to enable them to compare their practice with mine, and not for the sake of advocating any special practice, as the *ne plus ultra*, or of raising a standard which no one need aspire to, by some different mode, I will describe briefly my present manner of using gold foil; for, among the different discoveries which I have made, is that *many others* bring out just as good operations as I can, by my method of filling teeth, by modes and manipulations which would prove a perfect failure in *my* hands. But while I condemn no one's method, I may be allowed to prefer one practice as having, in my judgment, advantages over others. Formerly, or in the early stages of my practice with adhesive foil, I used it to fill the entire cavity, whether great or small, but now make the following modifications:

1st. I seldom or never now fill a cavity entirely with adhesive foil.

2d. I now use from eight to ten times as much *soft* foil, on the average, as I do adhesive foil.

3d. *I uniformly use both kinds in filling the same cavity*, unless it be a very small cavity, in which I generally use adhesive foil only.

4th. *I uniformly use my soft foil in the form of cylinders*, varying in length, diameter, and compactness to suit the circumstances of the case.

5th. In each and every case I continue to use cylinders so long as I am sure that every part of the cavity can be reached by them, and they can be made as solid and secure as if done by pellets of either kind of gold.

6th. After the operation is carried as far as it can be with *certainty* with cylinders, I then use firm but small pointed instruments (pluggers) *with but little taper*, and pierce any and every part of the filling, and treat these permeations as new or original cavities. *These I fill with adhesive foil*, and this is now the only way or manner in which I use adhesive foil.

NECROSIS.

Mrs. S. is sent to me by Dr. L. to examine a bony tumor of the mouth.

Condition of Patient.—Find a large tumor on the central portion of the hard palate, extending over its whole surface. There are four openings into it. The mucous membrane is red, and angry looking about the apertures, from which a sanguino-purulent fluid constantly exudes. The probe introduced into these openings reveals necrosis of the palate bones.

HISTORY.

Mrs. S. is about 40 years old, of scrofulous diathesis. Has been subject to ulcerated bronchi at different times; the last time, but a few weeks before this disease of the palate commenced. Three weeks since she had a vulcanized rubber plate, mounting artificial teeth, inserted. The palate immediately became sore. She continued to wear the plate, as her friends told her she must "get used to it." After a week she was unable to wear it on account of the swelling.

What appeared to be a *tumor* in the mouth, is only a very prominent *median* ridge of the palate bones, with which most dentists are familiar. It was not strange that a physician should mistake this and the swollen tissues together for a bony tumor.

We may thank this physician for his good sense in referring the case to an oral surgeon.

As there are no loose pieces of bone to remove, I dismiss the patient with directions as to the general health, and frequent visits for examination, so as to remove dead bone as often as it is detached by nature.

DID RUBBER CAUSE THIS NECROSIS?

It may be that it was caused by pressure of the plate on a mucous membrane ready to take on inflammatory action, and persistence in wearing the plate after there was decided inflammation. On the other hand a subacute and chronic inflammatory condition of the mucous membrane under rubber plates is

so very common, even when there is no particular *pressure*, that there is very good reason to believe that the necrosis may have been caused by the plate being one made of *red* rubber.

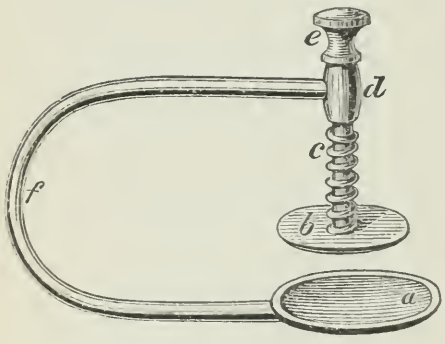
The mercury in the red rubber may undoubtedly act in this local way as disastrously, in producing necrosis of the palate bones, as that drug often does when taken into the circulation, by the stomach, as a constitutional remedy, in large and repeated doses.

I advise my friends to abandon the use of rubber plates. Cheap plates can be made of more wholesome material.

An aluminum plate is infinitely preferable, both on account of brightness, strength, and comfort, while it is a metal next in purity to gold. CHASE.

PAROTID DUCT COMPRESSOR.

It is made of steel, and plated. "a" is a concave cup which is placed inside of the mouth over the opening of the duct. "b" is the corresponding cup which goes outside of the mouth and the cheek against the inside cup. "f" is of spring temper to accommodate the instruments to a *thicker* cheek. "e" is the head of the rod attached to "b" and "c" is a spiral spring around the rod to press "b" against the cheek. "d" has an opening through which the rod plays.



The above cut is a good representation of an instrument which I have used for nearly a year, an account of which was given in the May No. of this Journal for 1869.

It is used to close the mouth of the parotid duct while operating on the teeth. By placing a thick piece of spunk about a half an inch square over the duct of Steno, and then applying this compressor it entirely shuts off all moisture from that source.

I would not be without it for a hundred dollars a year. In fact it is quite as indispensable to me as the sublingual duct compressor. The use of these two instruments renders the rubber dam less imperative. When it is any inconvenience to apply the latter, the use of the former are often all that is necessary. The same one will answer for either side. They can be made by any instrument maker. Spackler, of this city, makes them, silver-plated, at $2.50 each. CHASE.

SENSITIVE DENTINE.

In those cases where the most exquisite torture is inflicted on a patient by the excavator, which could not be relieved immediately by the usual remedies, I have found the following practice very satisfactory both to patient and myself:

Cleanse the cavity gently with tepid water, and remove so much of the decay as can be with the willing consent of the patient. Then plug with the "osteoplastic," or "ox. chlo. zinc." The plug may remain from a day to three months. In some cases one day helps the matter very much. If the dentine is hard, a day is as good as a week. But if it is soft then two or three months is better. In the latter case see that your patient uses a diet containing vitalized lime salts in abundance. By vitalized I mean those salts which are found in vegetable or animal tissue naturally. CHASE.

HEAVY FOILS.

Dr. Fourché, Knoxville, Tenn., had gold rolled between copper plates, and filled teeth with it, in 1847 or 1848.

S. HORINE.

Mechanical and Miscellaneous Department.

REPAIRING ARTIFICIAL WORK.

Continued from Vol. I, Page 528

In continuation of a series of articles on repairing artificial work, which have appeared from time to time in the JOURNAL, we offer the following suggestions on the repairing of rubber work, not as an advocate of rubber, but the fact, that a very large proportion of the cases brought to the dentist for repairs, at the present day, are rubber, seems to demand that we offer something upon this subject; and we give it, not without the hope, however, that the time will come when there will be no call to repair rubber work. To repair a partial or full plate, broken in twain or cracked, if the fracture does not pass beneath a block, we adjust the parts as accurately as possible, and retain them in position by melting a little gum shellac on the lingual surface of the plate. We prefer the shellac to wax or any other substance commonly used for this purpose, because it holds the parts in position more securely than any of these substances. When the pieces are thus adjusted lay the plate on the table with the lingual surface downwards, and cover the palatine surface with plaster, mixed with water to which salt has been added, to the depth of half an inch. The salt serves two purposes: it causes the plaster to set quick, and in the process of vulcanizing it renders it soft, so that it is easily removed from the case.

When the plaster is sufficiently hard, trim off any surplus that may have run over upon the teeth, remove the shellac from the lingual surface, and take the case to the lathe, and burr down this surface, to the thickness of a sheet of paper, along the entire line of fracture; lay over this burred surface a sheet of beeswax, such as is furnished for trial plates; trim the edges of

the wax nicely, and see to it, that the wax adheres to the surface of the plate so as to exclude all plaster in flasking. In flasking the case let the plaster come up to the cutting edges of the teeth, leaving only the lingual surface of the plate exposed in the first half of the flask. Trim, varnish and oil as usual before filling the remaining portion of the flask. When the plaster is set separate the flask *without* the aid of heat; remove the wax from the lingual surface and replace it with a piece of rubber of the same size and shape; close the flask and vulcanize.

Dr. Palmer suggests that the burred surface be coated with a solution of rubber before packing. The rubber solution is made by dissolving the Star rubber in chloroform. The Dr. claims that it makes the new rubber adhere more firmly to the old, but as we have never had any separation take place where the surfaces have been kept perfectly clean, we do not think it necessary. For partial sets, or for cases where the fracture does not pass under a block, nothing further is needed to make the plate as strong as when new, but for full dentures, where the fracture passes through to the front, something more is needed than merely uniting the plate, from the teeth back to the posterior border.

NICKEL PLATING.

The process of nickel plating recently discovered by Mr. Adams, of Boston, promises to be one of the most practical and valuable inventions of the day. Nickel being a metal which resists the action of the dilute acids, also the action of the atmosphere and the gasses; capable of receiving a high polish, which it retains for a long time; being also much harder than the metals heretofore used as a covering for base metals, not easily abraded, consequently more lasting, especially adapts it as a covering for dental and surgical instruments, fine machinery, &c. The difficulty heretofore seems to have been in obtaining a coating which would be sufficiently tenacious and adherent to be lasting.

Mr. Adams observed that when a solution of nickel contains the slightest traces of potash, magnesia, etc., the metal instead of being deposited pure will be found mixed with little particles of the peroxide of nickel, which takes from the adherent plating all its cohesion and tenacity. His discovery is in the use of nickel salts, entirely free from a fixed alkaline substance, such as the double sulphate of nickel and ammonia, or the double chlorate and ammonia. The salt is decomposed in the bath, the nickel is deposited on objects placed at the negative pole, and the solution keeps neutral.

We have been using, for four months, a set of nickel-plated pluggers, which we obtained of M. M. Johnston, of New York, which have thus far given perfect satisfaction. The plating is very uniform and smooth, and retains its polish almost perfectly. We were so well pleased with the plugging instruments that we have since had our forceps plated, with equal satisfaction. We feel that the thanks of the profession are due Mr. Adams for his discovery, by which so much time, labor and care necessary to keep steel instruments bright and smooth, is saved to the dentist.

CHICAGO DENTAL SOCIETY.

The Chicago Dental Society held its regular monthly meeting at S. S. White's Dental Depot, January 7th, 1870.

The President, Dr. J. H. Young, in the Chair.

Members present: Drs. Crouse, Dean, Clapp, Garnsey, Cushing, Albaugh, Swaine, Marsh, Stephens, Brown, Enos, Ellis, Noble, Sherwood and Koch.

After reading the minutes of the previous meeting the Society proceeded to consider the resolution offered at the last meeting by Drs. Noble and Sherwood, to rescind the code of ethics; which was made the special business of this meeting.

Dr. Noble said:—

This code of ethics was adopted in accordance with a resolution of the American Dental Association, for the purpose of ren-

dering this Society eligible to representation in that body. It was adopted hastily, at a meeting when there were but few present, and upon the eve of an election of delegates, and had never been published nor distributed among the members. Quite a number knew nothing of its adoption, and a few knew little of its requirements until the recent case of its violation brought the subject fully before us. The objection which had been raised, and in fact the only one which seemed to exist, relates to section 3, article 2. He called for the reading of the section, which is as follows :

"SEC. 2. It is unprofessional to resort to public advertisements, cards, hand-bills, posters, or signs, calling attention to peculiar styles of work, lowness of price, special modes of operating, or to claim superiority over neighboring practitioners ; to publish reports of cases, or certificates in the public prints ; to go from house to house to solicit or perform operations ; to circulate or recommend nostrums, or to perform any similar acts."

This section, he claimed, was vague and unfortunately expressed. So much so, that it was subject to various constructions ; some contending that it implied that it was unprofessional to advertise in any manner, and others, that it only referred to advertisements calling attention to particular styles of work, lowness of price, or special modes of operating.

He believed that this destroyed its usefulness.

He was not an advertising man, and was in favor of as stringent a code of ethic sas any one, yet he believed that there were more objectionable modes of advertising than any enumerated in this clause, and resorted to, almost daily, by some who hold up their hands in holy horror at the appearance of a card in the newspaper over the name or address of the publisher.

He had been a member of the Society since its organization, and believed that its object was for the purpose of bringing the members together for discussion, and for the aid and encouragement of the younger members, particularly, and by these means of elevating the standard of the profession in this vicinity.

His greatest objection to the section referred to was, that the construction placed by many upon it would not only prevent

many of the younger members of the profession and others who had but recently located in the city from becoming members, but would, he knew, drive some who were already here from the Society and whom he felt it desirable to retain.

He believed that it should be either repealed or so modified as to be acceptable to a greater number, and expressed in plain and unmistakable language. He desired it particularly understood that should the motion prevail, it did not prevent the Society from adopting a code of ethics substantially the same as the existing one, but stripped of its objectionable features, and which would enable the Society to be represented in the American Dental Association.

Dr. Sherwood said:—He regretted that he had not had the time to prepare his objections to the code of ethics in form as fully as he had intended on making the motion. His object principally was to find out what might be said on both sides. Not being present when the code was adopted he did not know how it was understood, or what was its scope or meaning. To him the absurdity of prohibiting members of this Society from advertising in the public prints is singular.

You cannot make or have a code of ethics that will make members gentlemen, or gentlemen good practitioners; and it seems wrong to be living under a code the rules of which are being violated in some manner by nearly all the members every day. Better rescind it at once. As he reads the clause he feels that he is shut out from membership of the Society, because he advertises in the public prints. He professes to be a live dentist, and believes in advertising and letting people know that he is on hand to attend to their bad teeth.

Dr. Crouse said:—That he was most decidedly compelled to oppose the position taken by the last two speakers. He wished it distinctly understood that he was opposed to advertising in toto. Thinks that dentists should only advertise by their work. He was sorry to hear the gentleman who moved the rescinding of the code say, that he is not fully prepared, as he should think a month's time ample. Was sorry not to hear any *argument* in favor of rescinding. Thinks dentistry a loose kind of business

which required regulating. Says there is nothing in the code forbidding the insertion of a card in the public prints, but it forbids quack advertisements. The medical profession does not recognize as members those who indulge in such advertisements, neither should the dental. Thinks it time for separating the sheep from the goats, and advocates a rigid enforcement of the code.

Dr. Ellis said:—He thought it unjust that we should be bound by a code of rules made by gentlemen hundreds of miles away from Chicago, nine-tenths of whom do not live up to the same themselves. Thinks the dentist owes it to himself and his family that he should advertise. Dignity is a very good article, but would not sustain life; he had to have bread and meat, and this he would get by his advertising to the public that he could be found at such a place, &c. He did not think that any member should go from house to house soliciting patronage, but that was no reason why they should not advertise. Says that he has sacrificed money and time for the elevation of the dental profession, but has now made up his mind to work for J. Ward Ellis.

Thinks it about time we return to specie payment; S. S. White charges him $30 per ounce less for gold foil than during the war; rents and all commodities of life have come down; and thinks it no more than right that dental fees should also be decreased, and he means to apprise people of the fact, that he has come to a specie basis, through the public prints, and expects to make money by so doing. He thought being fettered by a code was a *decidedly retrograde* step in dental progress, and he hoped the Chicago Dental Society would take the lead in an advance step and throw off the yoke. He claimed the privilege of pushing his business as he believed best; was willing to do all in his power to promote the welfare of the Society, but it must not try to starve him. Thinks that high prices sent from thirty to forty thousand dollars out of Chicago to Eastern dentists every year, and that we should attempt to prevent this.

Dr. Stephens said:—That he was in favor of a code of ethics; thought the wording of Section 2, Article 3, should be more clear. Thinks that there are many more reprehensible ways of

advertising than those enumerated in said section. Editorial notices, that: "It is a luxury to have a tooth pulled in Dr——'s office;" or, "that a certain bishop is stopping at a certain dentist's residence," or, "that a certain dentist, member of the American Dental Association, had just returned from New York," from whence he had been returning for the past six years, he thinks much more worthy of the stigma of quackery.

Dr. Dean said:—

The code of ethics which has become the organic law of this Society has been adopted substantially by nearly every respectable dental society throughout the country. And before it was adopted in this form, it was tacitly assented to, in the main, by dentists and dental societies generally. The special necessity for a *written* code of ethics, I conceive to be for the information of the younger practitioners, who may desire to know what is held to be professional, and what unprofessional, by the leading members of the profession. It has also, doubtless, a tendency to make us more honorable in our dealings and intercourse with each other, and with the public. In adopting this code I think we took a step forward. In rescinding it I am sure we take a decided and visible step towards the humble source from which our profession sprung; and I certainly hope our little Society will not take the lead in this direction. If it do I am sure it will not be followed by the profession generally. There are too many dental colleges in existence—too many of education, refinement and high moral standing in the profession and constantly flowing into it, to allow this retrograde movement to become general. So, gentlemen, we need not fear that any act of ours will greatly retard the prosperity of the general profession. It will be ourselves, mainly, that will be injured and disgraced by turning our backs to the setting sun and pursuing a course diametrically opposed to the spirit of the age, as we should do by abrogating our code of ethics.

But why should we desire to throw aside this code? Is there any thing in it that restricts us within unwilling limits—any thing that oppresses us in its provisions? If so, let us find it and adopt something better in its place by *revising*—not by rescinding the

whole code. [Here the Doctor read the most important part of the Code of Ethics, commenting upon each section, and arguing that by rescinding these the status of the Society would be very much lowered in the esteem of the profession and the public. That voting to rescind these sections would be equivalent to affirming what they deny, and denying what they affirm, &c., &c. Hoping there were few, if any, who would allow their votes to *imply* this, which they certainly would unless they sustained the code.

On reading Sec. 3 of Art. II, he said this was the only portion of the code which had been denounced as objectionable by the advocates of the resolution to rescind it, and asked if there was one member of the Chicago Dental Society who considered the catalogue of acts to be professional. He believed all the acts enumerated to be unprofessional—advertising among the rest.]

He continued :—If advertising brings business to an office, it brings that class of patrons who are influenced to come by these advertisements. This being the case, the advertisement that promises most, will bring the most patronage. And would not the greatest quack be able to out-do modest merit in the advertising line ? Is it not a pretty general rule in professional advertising that the less merit the advertiser possesses the greater are his pretensions, and the more numerous and seductive are his hand-bills and posters ? I care not whether he be physician, lawyer, or dentist, you will always find this to be the case. They may obtain patronage in this way which they have not the merit to secure otherwise ; but the man who gets his business by this means, must, almost inevitably, in his intercourse and dealings with the class of people who have been induced by his advertisements to apply and *negotiate* for his skill—he must, in order to secure all the jobs which his advertisements have scared up for him—lower the standard of his work as well as his prices for doing it. This is the certain result that follows such "competition" as advertising lowness of price, as an inducement to patronage. It is true, in many kinds of business, both the producer and consumer—both the buyer and seller are benefited by competition. And in some respects legitimate competition—honora-

ble competition—is a benefit to the members of our profession. But the supply of the dentist is limited to the product of his own hand and brain. If he strain these to their utmost capacity to increase the number of his operations, in order that he may diminish the amount charged for each, and "compete sharply" with his advertising neighbor, he must do it at the expense of his patrons' teeth, and at the expense of his own health and reputation. Such competition as forces the dentist to increase the number of his operations beyond what he is capable of doing to the very best of his ability, in order that he may do his work as cheaply or cheaper than his competitor, I call illegitimate competition. But that kind of competition which stimulates the dentist to acquire skill and knowledge, and when acquired to use them for the best possible good of his patient, I call honorable, legitimate competition. *Cheapness* is almost invariably the inducement offered by the advertiser, and competition in this respect is in most cases ruinous to all parties concerned. I shall, therefore, vote against rescinding our present Code of Ethics, and especially the article which condemns advertising as unprofessional, believing, as I do, that advertising tends, as nothing else does, to lower the dignity of our profession, and diminish our skill and usefulness as dentists.

Dr. Cushing said—

The Society was organized under peculiar difficulties and that great latitude was necessarily allowed in the matter of the admission of members, and the construction placed upon ethics. But it had been hoped that the members would become educated up to a higher professional standard, and that a more just and strict construction of ethics would follow. He was very much surprised and sorry to hear Dr. Ellis say that there had been no progress. To himself, it seemed that there had been great progress, and that the society had, considering all things, been a decided success. He regretted that Dr. Ellis had taken up so much time talking about his (Dr. Ellis') fees, and why he had reduced them, and had said so little to the question under discussion. He had expected to hear some arguments in favor of the repeal of the code, but could not see that any thing worthy of

that name had been advanced. He had been at considerable pains to inform himself as to the working of other societies, and found by correspondence with parties in New England, New York and St. Louis, that the same code of ethics had been generally adopted, and that in the main it was lived up to, while the testimony was unanimous that the general influence of the code was good, and the societies would not give it up. He found the medical profession agreeing that their code of ethics had a beneficial influence, though doubtless daily violated in some of its provisions, by prominent men, but that some were restrained within the bounds of decency in outward matters by the code, who might not be held by any other means, and thereby the profession was held in higher esteem.

He thought the arguments urged against the code of ethics, on the ground that they would not make "gentlemen of boors," or "good operators of poor ones," the weakest possible plea, one which might be used with just as much force against all laws against crime. Such laws were made for the protection of society, and it was never urged that they should be repealed because they did not make gentlemen or christians of men who were at heart murderers and thieves. Such laws exerted a restraining influence upon evil disposed persons, and likewise a code of ethics operated in the same manner. He begged the society to consider well this matter before repealing the code of ethics, which, in his opinion, would be taking a great and decided step backwards.

Dr. Sherwood said:—

He was glad to hear the gentlemen in favor of the Code, place so liberal a construction upon it. If they read it so as not to prevent him from advertising in the public prints, he has no issue with them. An advertisement may show one's qualifications as well as his work, and all will agree that his operations do advertise him. On the other hand, a man's method of advertising may show his ignorance and unfitness to do good work. Most men in the profession advertise in some form. Believes it is better to be without a code of ethics than to try to do business under one that we cannot and do not live up to. Is not strenu-

ous to have the code rescinded, and has thought that it may be best to let the matter rest until the next meeting of the American Dental Association, and then see if we could not get the obnoxious article amended.

Dr. Ellis said: —

He was indebted to the press and the people for his living, not to the dental profession; thought the abominable code ought to be repealed and the Society throw off the yoke and take an independent stand. He wanted the Chicago Dental Society to take the lead in this, and place every member on his honor. As for himself, he said he knew of the existence of this code, that he had violated it knowingly and wilfully, because he considered that it enslaved him, and was bound to throw off the shackles.

Dr. M. S. Dean said: —

There is another reason why I should feel it my duty to vote against the resolution to rescind the code, and if there were no other, I should consider this a sufficient one. All Dental Associations adopt constitutions for the government of their members; and in all that I have seen, (and I have seen a good many) there are provisions for the expulsion of members for unprofessional conduct. In the constitution of the Chicago Dental Society, there is a provision of this kind. Now, if we have an article in our constitution telling us how to deal with members who may be found guilty of unprofessional conduct, is it but fair and honorable in us that we *specify* in a code what is held to be unprofessional, so that younger members who may honestly desire such information may be able to obtain it? By voting to rescind this code we should merely blot out its specifications. In our constitution we should still say to the young and inexperienced members: "You are liable to expulsion if found guilty of unprofessional conduct;" — but in our proceedings to-night — if we should abrogate our Code of Ethics — we should withhold, nay *withdraw* all that information which is justly their due and which other societies afford their members. This would be injustice to them and dishonorable in us. They would be just as liable to be expelled for unprofessional conduct, if tried by the Society under the constitution and found guilty, as they

would if the code remained the organic law. For, in case of a trial for the breach of professional decorum, the Society would have to be governed by the *common law*—in the absence of a special law—which common law must be the code of ethics as adopted by the American Dental Association. So the result of a trial would be precisely the same as before the rescinding of our present adopted code.

Seeing, therefore, no possible good that can flow from the abrogation of our code, and greatly fearing that disgrace and disorganization would follow, I sincerely hope the resolution will not prevail.

Dr. Crouse then spoke in opposition to the resolution. Said he was not aware of a reduction of $30 an ounce on gold foil. He much prefers to have his patients advertise him by encomiums upon successful operations. Thought that many operators who advertised lowness of price really received much more for their operations than he did, so far as time actually spent in preparation and filling was concerned. Thinks thoroughness much more a consideration than cheapness.

Dr. Stevens then moved that the yeas and nays be called upon the resolution. Carried.

The yeas were: Drs. Sherwood, Clapp, Garnsey, Ellis and Noble. 5.

The nays were: Drs. Stephens, Marsh, Brown, Dean, Swayne, Koch, Crouse, Cushing and Albaugh. 9.

Dr. Enos having left before this and the President not voting.

Dr. Garnsey then moved that the Code of Ethics be printed and attached to the Constitution and By-Laws, as previously ordered and deferred. Carried.

Society adjourned.

PLASTER IMPRESSION FOR PARTIAL SET.

I have met with success, recently, in obtaining a plaster impression for a partial set where the palatine arch was so deep that it failed, in several instances, to secure a correct impression.

I bent a piece of block tin, (such as is used as base plate in Stuck's process), and fitted it to the impression cup. I arched it so that it would press the plaster up well against the palate. The tin was retained in place by simply uniting it to the sides of the cup by melted wax. I oiled the remainder of the cup—that part coming in contact with the plaster—oiled the teeth and inserted the impression cup filled with plaster. After the plaster had hardened I removed the cup, leaving the plaster with tin attached in the mouth. I cut through the plaster to the teeth and broke off all that part of the plaster outside of the teeth. I then removed the impression without any difficulty, and found it correct.

There is no patent on this process—unless Stuck claims an infringement. C. A. KITCHEN.

LITTLE ITEMS.

If you use a foil compressor, the wooden one is preferable to the tin. I made one out of pieces of a cigar box; make one and try it.—The chamois skin roller is better than the india rubber. Made one from same material; try it.—If you use ligatures around the teeth to secure the rubber dam, cut the threads into lengths of one foot; tie on each end of the thread a round india rubber button (being light and strong). In using silk thread, put the button twice through the loop (the first half of the knot), thereby forming the surgeon's knot, it is less liable to slip. Wax the thread with good yellow wax, and at the time you use it keep a dozen ready for use, as some threads *will break;* try it. F.

The Missouri Dental Journal.

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From the Chicago Medical Examiner.

THE RELATION OF THE WHITE BLOOD CORPUSCLES TO SUPPURATIVE INFLAMMATION.

Translated from the French of A. HENOCQUE.

Two important communications have been made, one to the Academy of Sciences, by Mr. Robin, in behalf of Mr. Feltz, the other to the Academy of Medicine, by Mr. Vulpian, in behalf of M. Hayem, treating of histological subjects of much interest to the anatomist and pathologist. We propose, therefore, to present to the readers of the *Gazette* a brief résumé of the results of various experiments which have been made in Germany, England and France. The question is not one simply of histological and pathological fact; it involves also a theory of inflammation that has been designated the "Theory of Cohnheim." The fact is the passage of the leucocytes, or white blood corpuscles, through the walls of the vessels in the inflamed tissues. The theory is the application of this fact to the history of suppurative inflammation. We shall examine both.

Less fortunate than Cohnheim, and those who have repeated his experiments, the real inventor, A. Waller, had not the good fortune to attract attention to his discovery. Even after the experiments of Cohnheim became known in his own country, it was not England that claimed for him priority, but Hungary. Koloman Balogh, professor at Pesth, first called attention to the works of Waller.

In the year 1846, Waller,* studying the circulation of the blood, in the mesentery of the toad and in the tongue of the frog, discovered the passage of the red and white corpuscles through the walls of the capillary vessels. He concluded, after a prolonged series of experiments, that the white corpuscles could penetrate the vascular walls unchanged; and that the blood possessed the property of closing the openings which had served for their passage.

In another work, published in the same volume, under the title of "Microscopic observations on the perforation of the capillaries by the corpuscles of the blood, and on the origin of mucous and pus globules," Waller established the identity of globules of pus and of mucous with the blood corpuscles. This paper elicited neither criticism or discussion.

In September, 1867, Cohnheim published† in the *Archives of Virchow*, an extended work, in which he established the fact that pus corpuscles existing in the inflamed cornea are not formed there, but that they have their origin outside of the cornea, and are in fact leucocytes, or white blood corpuscles, which in virtue of their ameboid movement, pass the walls of the bloodvessels in the cornea.

Cohnheim believed himself the discoverer of this fact. His experiments were made upon the hare and frog, and in the latter, after having colored the white corpuscles by carmine, or blue aniline (which is accomplished by injecting the coloring matter into the lymphatic sacs,) he found the white corpuscles containing particles of color in the inflamed cornea.

The same phenomenon was produced upon the cornea of the hare. Cohnheim demonstrates directly, the passage of the white and red corpuscles through the vascular walls of the mesentery of the frog, and describes with care the successive stages of the migration of the leucocytes.

These experiments were soon repeated, and the results have

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* A. Waller, "Philosophical Magazine," vol xxix. Koloman Balogh, "Virchow's Archives," 45 Bd, p. 19.

† Cohnheim. "Archiv. of Patholog., An. et Phi." 40 Bd., p. 679.

varied upon some points. In order to appreciate them well, it is necessary to separate the observations upon the cornea and the non-vascular tissues, from those made upon structures rich in vessels.

Hoffman and Recklinghausen* observed that in the cornea detached but preserved by a special arrangement, there were produced new elements, having ameboid movements. They, therefore, maintained that in the cornea, pus may be formed, directly at the expense of previously existing elements. These authors do not contradict the facts observed upon the mesentery.

Stricker and Norris† have also concluded from their experiments, that in ceratitis the contractile cells are formed by the multiplication of the elements of the cornea itself. In inflammation of the vascular parts, the very exact experiments of these authors have, on the contrary, fully confirmed the results of Cohnheim.

Prominent among the works recently published, is that of Kremiansky‡ (January, 1868). As it is less known than the preceding, we shall give a more detailed *résumé* of its most important points. The first series of experiments consist of microscopical observations of the inflammatory process in various animals. The author has perfected the manner of operating; and in the mammifera, the white corpuscles being difficult to distinguish, he colors them by injecting in the blood aniline, or better still, cinnabar finely pulverized. A few hours after the injection, the greater part of the white corpuscles contain particles of cinnabar, thus rendering these elements apparent.

Still further, the author has discovered a means of rendering the phenomenon more rapid, by employing cauterization, especially in the use of the crystals of cantharidine, distributed along the veins. By this means the migration of the leucocytes is accomplished in about ten minutes.

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* Hoffman and Recklinghausen. "Central Blatt," 1867, No. 31. Hoffman. "Archiv. f. Patho., An. and Phys.," Bd 44, 204.

† Norris et Stricker. Vienna, 1869.

‡ Kremiansky. "Weiner Medizinische Wochenschrift," Nos. 1 to 6, 1868.

His first observations confirm those of Cohnheim. In fact, Kremainsky has been able to follow, in the mesentery of the frog, the various phases of the process, that is the enlargement of the veins, the retardation of the circulation, the accumulation of the white globules, and, at the border of the blood stream, the stoppage of the white corpuscles against the interior surface of the wall; the appearance of accumulations in the form of spheres, of buttons, of cones, on the exterior of the vascular walls; the gradual increase of these accumulations; the complete passage of white corpuscles out of their vessels, with their successive modifications, into pyriform, fusiform, stellate, polygonal, and rounded bodies. These globules accumulate around the vessels, then break into the neighboring tissues with change of form, and finally assume the well-known appearance of pus corpuscles.

Still further, Kremiansky has seen the corpuscles, at the same time, pass through the veins and the wall of the lymphatic, by which, in certain cases, it is surrounded. In the capillaries, the white corpuscles commence their migration when the stagnation of the blood is complete; they remain often imbedded in the midst of the walls. The red corpuscles can also pass the capillaries, but they also often remain engaged in the walls of the vessels. In the arteries, the author has never witnessed this migration of the globules.

These results differ from those of Cohnheim in some points of detail. In fact, Kremiansky has seen the passage of the red globules through the veins, as well as through the capillaries. They also undergo this change of relation independently of the white, although Cohnheim believed the red globules only passed the capillaries following the leucocytes. Such are the facts observed in the simple irritation caused by the exposure of the mesentery of the frog to the action of the atmosphere. The phenomena are somewhat different when a local irritation is produced by the application of crystal of cantharidine to a vein. There are observed, first a narrowing of the vessels at the point of application of the irritant, an

acceleration of the inflammatory process, which limits itself at a determined point, the passage of the leucocytes through the wall is much more easily seen, and finally, there is added an important fact; namely, the lymphatic corpuscles which are encountered normally in the conjunctive tissues of the mesentery, change their position, moving towards the irritated part, and accumulating there.

These phenomena may be readily observed in the tongue of the frog. Kremiansky has also observed the same fact in the wing of a bat, and in the inflamed mesentery of the hare and dog; but in the latter, has not been able to follow directly the ulterior changes of the white corpuscles.

A second series of indirect observations complete the study of the process. After having injected into the veins of the frog, the hare, the dog, the cat, and the fowl, a weak saline solution, containing cinnabar in suspension, he detected the existence of inflammation in various organs, and was able thus to study the position occupied in the tissues, by the leucocytes containing grains of cinnabar. These experiments have not been conducted exclusively upon the non-vascular tissues (cornea cartilages,) but have also been made upon the peritoneum.

The conclusions of the author may be summed up as follows: The inflammatory products (pus exudations, false membranes, adhesions,) are made up histologically, for the most part, of the white corpuscles which come from the veins and capillaries, the walls of which they traverse, (*émigration des leucocytes.*) On the other hand, the forms contained in the inflammatory products may come from the elements which are contained in the conjunctive tissue of the cornea, or of the mesentery, and which have ameboid movements, and are really the lymphatic cells. Finally, these inflammatory products may be formed in part by a proliferation of the fixed corpuscles of the conjunctive tissues, as in the inflamed cartilage, when young cells develop at the expense of pre-existent cells.

In England, Charlton Bastian* published and repeated the

* C. Bastian. "Medical Times and Gazette," March 9, 1863.

experiments of Cohnheim. He saw not only the migration of the leucocytes, but that of the red corpuscles, which pass the walls, not by a simple passive phenomenon, but as he believes, in virtue of an active property, these corpuscles seeming to possess, in themselves, ameboid movements.

In France, the works of Cohnheim have been noticed by a very faithful analysis published in the *Archives de Physiologie Normale et Pathologique*, for March, 1868. Mr. Chalvet, in his inaugural thesis (*Physiologie Pathologique de l' Inflammation*, 1869,) has also noticed these experiments; and more recently the researches of MM. Hayem* and Feltz† have been the occasion of the discussion of the subject in the academies. Mr. Hayem has made observations upon the mesentery and lung of the frog, and his descriptions are, in the main, in accordance with the published results of Cohnheim. He has found the epithelial layers and the conjunctive tissues of the mesentery almost perfect. The epithelial covering remains inactive during the process of inflammation, and is penetrated by the leucocytes. Following the development of traumatic pneumonia in the lung of the frog, Mr. Hayem has observed that the inflammatory process presents the same phases as in the mesentery, and that, while the white and red corpuscles are seen to pass through the alveolar walls and partitions, not a single nuclear multiplication in the corpuscles of the inter-capillary spaces is observed. But, on the contrary, a certain number of these elements become transformed into granular bodies, under the eye of the observer.

I will add that the experiments of M. Hayem have been made, in some sense, publicly, in the laboratory of Mr. Vulpian; so that a number of persons have been able to follow them, and Mr. Vulpian himself has no hesitation in considering the phenomenon of migration as a fact perfectly established, and easy of observation.

We cannot too strongly urge upon histologists the importance

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* Hayem. "Gazette Médicale," No. 1, 1870.

† Feltz. "Journal de l'Anatomie et de la Physiologie," No. 1 1870.

of repeating these experiments, and arriving at personal knowledge upon the subject; especially as it can be accomplished at a sacrifice of but little time and patience. For the purpose of verification simply, we would recommend the means employed by Kremiansky, that is the application of crystals of cantharidine upon the mesentery or tongue of the frog. We have been, by this means, able to follow closely the modifications of the circulation of the inflamed parts, and to observe the accumulation of the leucocytes upon the interior surface, and their migration through the wall. In these studies, we confess we sought for the causes of error in Kremiansky's experiments, rather than to verify them, as we were strongly inclined to doubt the correctness of his conclusions. The doctrine has met with strong opposition, not only on its application to the non-vascular tissues, such as the cornea, but the alleged fact itself, of the migration under any circumstances, has been strongly denied. We shall notice only those opponents who attempt to refute the doctrine by experiment.

Koloman Balogh,* in 1868, repeating the experiments upon the mesentery of the frog, did not observe the passage of the white corpuscles through the walls of the vessels. He pointed out certain causes of error, and gave a different interpretation to the appearance of the inflamed mesentery. He also called the attention of the scientific public to the fact that to A. Waller of England, and not to Cohnheim, is due the credit, if such it be, of priority in the publication of the doctrine.

Mr. Feltz, of Strasbourg, has experimented upon the tongue and mesentery of the frog, and the mesentery of the young mouse; he has also studied the artificial inflammation of the peritoneum; tried without success the injection of aniline, and notwithstanding repeated observations, has never seen the white corpuscles pass the vascular walls. Mr. Feltz agrees upon one point with Cohnheim; that is upon the absence of remarkable modifications in the elements of the peritoneal connective tissues. Still farther, he has never seen the extra-vascular ele-

* Koloman Balogh. "Archives de Physiologie," No. 1, 1869.

ments, whether by direct division or by multiplication of their nuclei.

This is the state of the question, as to the passage of the leucocytes through the walls of the blood-vessels. Some have seen it, others have not seen it. The negation is an absence of knowledge, and we might rest here. True criticism, however, seeks to look into the details of the experiments, to discover, if possible, the reason for this difference of opinion.

Let us follow Mr. Feltz, step by step, in his argument and observations. One fact strikes us in his descriptions. If we exclude, in the experiments of Cohnheim, the affirmation of the direct passage of the leucocytes, we find a great analogy between the two authors. Indeed, Mr. Feltz has seen the inert layer upon the border of the blood stream, in which the leucocytes slowly circulate, the red corpuscles being in the centre of the current; he has also seen the accumulations of the white corpuscles on the interior surface, their adhesion to this surface, and their change of form; and, finally, he points out also the union of a great number of these elements upon the exterior surface of the wall. That which is wanting is the detection of the white corpuscles in the act of their passage or strangulation in the walls. The presence of these elements upon both sides of the walls involves, perhaps, the theory of their migration.

Mr. Feltz has seen still more. We quote: "After a certain time, there appears at the external border of the vessels, one or two, or even more, little asperities, which, when analyzed with care are found to be nothing more than the little masses of leucocytes, resembling in all particulars those upon the interior of the wall. These little external mamelons, composed of elements perfectly independent of each other, are quite as likely to be produced upon the points corresponding to the interior mamelons as upon other portions of the wall, and I have seen many times, fifteen, twenty or thirty corpuscles massed into points where there were, upon the interior of the vessels, only a smooth and simple lining of white elements."

Indeed, Mr. Feltz has almost seen the phenomenon complete.

It is to be regretted that he has not been more precise in giving exact information as to the volume of the little asperities, and of the little masses, because if they can be resolved into three or four leucocytes, a quantity necessary to form a little mass, it seems to us that they constitute more than a little asperity. The white globules of the frog are about eight to ten-thousandths of a millimetre (one-twenty-five-hundredth to one-thirty-one-hundredth of an inch) in diameter, while the smaller veins are nine-hundreths of a millimetre (one-two-hundred-and-seventy-fifth of an inch) in diameter. The thickness of the wall is about one-hundredth of a millimetre (one-twenty-five-hundredth of an inch); it follows, then, that the projection formed by three or four leucocytes upon the exterior of the wall, will be at least double the thickness of this wall. But it often happens that the asperities observed upon the exterior of the wall are in reality of the size of a leucocyte, or less, when first discovered. Besides, by observation, one may see masses, as Mr. Feltz has done, transformed into leucocytes assuming the globular form, sometimes two or three in succession, make their appearance. In fact, they follow each other through the vascular walls.

Mr. Feltz has seen, in a very transparent mesentery of a mouse, leucocytes appear at a point transversed by a single vessel, without there having been found a single interior asperity or mamelon in the whole extent of the branch under observation. This is a phenomenon which has been explained by Kremiansky, since according to him, corpuscles analogous to leucocytes existing normally in the mesentery, are endowed with spontaneous movement, and are seen to converge towards the vessels.

Mr. Feltz, in the second part of his work, endeavors to demonstrate by negative results, that pores permitting the passage of the leucocytes do not exist in the vascular walls, as these walls do not allow the passage of colored injections nor of fine particles of aniline. We shall return to this objection, which has a bearing on the theory of Cohnheim. Thus far we have endeavored to examine carefully the principal fact—the

migration of the corpuscles through the vessels, which constitutes the basis of Cohnheim's theory. This theory, however, comprehends the accessory facts and conditions which accompany or explain the passage of the leucocytes, as well as the application of these facts and conditions to the theory of inflammation and of suppuration.

Such are the two new points which we shall proceed to investigate. First, the experimentors who have seen the passage of these corpuscles, are called upon to indicate the mode and anatomical route by which the migration is accomplished. Cohnheim suggests the open mouths of the epithelium of the vessels. Unfortunately this is a point of anatomy still in doubt. The resistance of these walls to the passage of fine particles seems to be inconsistent with the hypothesis of open epithilial mouths. The experiments made with aniline, and with cinnabar, which color more easily, have not, up to the present time, furnished sufficient proof upon this point; it is necessary to wait for further developments before arriving at a conclusion. The three negative experiments of Mr. Feltz are not, in my opinion, of great importance; since, on the one hand, he has not seen the white corpuscles imbued with the coloring matter of aniline—a process of colorization very uncertain,—while, on the other hand, the result of the injection of cinnabar have been very clear, thus proving that the granules penetrate easily into the red corpuscles, and are even deposited in the various tissues. It is so easy to color the white corpuscles with cinnabar, that this fact need not be left in doubt. That which is more difficult to demonstrate is the *manner* by which these granules of cinnabar penetrate the tissues. But is this difficulty as to the *mode* a sufficient reason for believing that the *fact* of the penetration does not exist? No; it is simply a want of knowledge, but cannot negative a single determined fact. As to red corpuscles, they can be forced through the walls by pressure of the blood, *a vis a tergo*, for, notwithstanding the opinion of Bastian, and of other experimentors, the ameboid movement of these corpuscles is not yet demonstrated.

There are other conditions which favor the passage of the globules out of the vessels; such as paralysis of the smooth muscular fibre indicated by the enlargement of the vessels, but the discussion of all these questions would occupy too much time, we must be content to simply suggest them.

Cohnheim endeavored to show that suppuration is always the result of migration, or of the extravasation of the white globules. In his second article,* he insists upon the integrity of the fixed corpuscles of the conjunctive tissues of the cornea and of the mesentery, in his experiments. The pus, therefore, can only be produced from the white corpuscles or leucocytes which have passed from the blood. He claims that this is the case in both the vascular and non-vascular tissues. The facts which we have cited tend to support this theory, so far as it applies to the vascular tissues. The almost complete integrity of the fixed corpuscles of the conjunctive tissues, is a fact which has been remarked by nearly every experimentor — even Mr. Feltz; but as to the non-vascular tissues, there still remains, as we have seen, much doubt. The reason for these divergences of opinion are easily seen; they depend entirely upon the anatomical question of the texture of the conjunctive tissues.

Since Recklinghausen has shown, in the cornea, in a normal state, the existence of movable corpuscles, which are also found in the mesentery, where they represent cells and embryoplastic nuclei, described by Mr. Robin, other experimenters, (Huxley, Kühne, Koelliker) have also seen these elements endowed with ameboid properties or contractions. We have ourselves† followed the changes of form in these elements, in the mesentery of the frog. Finally, Kremiansky attributes to them a certain rôle in inflammation. The question is complex, and the synthetical study of the connective tissues does not seem likely to simplify it.

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* Cohnheim. "Archives of Pathol. et Phys." vol. xlv. p. 338.

† Hayem et Henocque. "Archives Gén. de Médicine," Juin et Juillet, 1866.

The theory of suppuration promulgated by Virchow, and generally adopted, namely, that pus is formed by the proliferation of the conjunctive elements, does not require an exhaustive study or analysis of each of these tissues. We find the evidence of this necessity when we examine the theory of Cohnheim for a definite idea or principle, the demonstration of which is found in the fact of the emigration of the leucocytes.

It seems to us that there is an evident agreement only between the theory and the phenomena observed in the mesentery; that is in the laminated and conjunctive tissues, properly so called, and that we may therefore adopt the following conclusions, analogous to those of Kremiansky:

1st. In suppurative inflammation of the laminated tissue, the act of suppuration is essentially vascular, the leucocytes pass the walls of the vessels, and are the elements called pus corpuscles.

2d. The embryoplastic elements, or the mobile corpuscles of the conjunctive tissues, have altogether an accessory part.

3d. As to the fixed corpuscles of the laminated fibres, their office is nil. There is no proliferation, in the ordinary sense of the term; there are notable alterations only in case the inflammation passes beyond the limits of suppurative inflammation. To apply these phenomena to tissues of conjunctive substances in general (tissues of the cornea, of bone, etc.), would be in my opinion, premature. For all these tissues the question is still one for investigation and discussion.

Finally, in looking over the phenomena and theories presented, we see on the one hand, a fact positively affirmed by a good number of observers, and on the other, a theory of which the limits are not yet well defined, and of which many of the elements are incomplete. The fact itself is almost fatal to the two principal theories, which, up to the present time, have been invoked to explain the formation of pus—that is the theory of proliferation, and that of spontaneous generation in the midst of blastema.

It will be readily admitted, that it is important to complete

the investigation as to the fact, rather than claim its impossibility because it is inconsistent with two theories which are themselves in opposition the one to the other. J.

[*From the Boston Journal of Chemistry.*]

HYDRATE OF CHLORAL.

Continued from Page 89.

This action upon the blood-vessels, and the effect in first causing dilatation, and then contraction of the pupils, show that the hydrate of chloral acts with great power on the sympathetic nerve. This nerve, as is well known, supplies the radiate fibres of the iris, which by their action cause the pupil to dilate. It is likewise the vaso-motor nerve which endows the blood-vessels with contractile power. Paralysis of the sympathetic will therefore be shown by contraction of the pupils and dilatation of the blood-vessels. The latter of these effects ensues first, and subsequently the pupils, which are first dilated through the action of the cerebral pressure, become contracted by the advancing paralysis of the sympathetic and the predominance of the power of the circular fibres. But a large dose eventually brings the heart under its influence, and likewise paralyzes the cerebral and spinal nerves. Hence, there is a less amount of blood propelled to the brain, and the vessels are not duly supplied with blood; the circular fibres likewise become paralyzed, but, these being stronger than the radiate fibres, the pupil remains immovably contracted. The general irritability of the whole system is therefore much lessened.

With these views of the action of the hydrate of chloral, I proceeded to administer it to the human subject.

Case I. *Acute Mania.*—I gave five grains hypodermically to a strong man, the subject of acute mania. He was quiet and not very irrational at the time. In a few minutes his pulse rose in frequency, his pupils dilated, and the ophthalmoscope showed

retinal congestion. He almost immediately afterward became furiously excited, and breaking away from those who attempted to hold him, rushed into the street. He was not caught till he had run nearly a mile. He remained highly maniacal for several hours.

The next day I gave him a hypodermic injection of twenty grains. He fell asleep in about forty minutes afterward, and remained so for ten hours, He had not previously slept for eleven days. During his sleep his pupils were strongly contracted. When he awoke, he was free from delusions, and altogether better than he had been for several weeks.

Two days subsequently I gave him another dose which acted in a similar manner. I may state here that both these injections produced large abscesses. The solution used was that prepared by Dr. Richardson—twenty grains to forty minims of water.

Case II. *Cerebral Congestion and Insomnia, the Results of Severe Mental Application.*—A dose of forty grains of hydrate of chloral was administered to a gentleman twenty-five years of age, suffering from cerebral hyperæmia and wakefulness. He had not slept any the night previous, and only about two hours a night for several weeks. The retinæ were highly congested and the pupils dilated. He took medicine at ten o'clock, P. M., and immediately went to bed. His mother, who sat by his bedside anxiously watching him, said that in less than half an hour he was sound asleep. He continued to sleep steadily till ten o'clock the next morning. At 12, M., he visited me. He had eaten a hearty breakfast, and felt in excellent condition. I examined his retinæ with the ophthalmoscope, and found that the congestion had disappeared, as had also the vertigo and ringing in the ears with which he had suffered. He slept well the next night, and has done so every night since, without medicine of any kind.

Besides these cases, I have given the hydrate of chloral in several others, similar to them in general features, and always with satisfactory success.

Case III. *Chorea.*—A young lady, fifteen years of age, came

under my care on the 10th of November, to be treated for chorea, from which she had suffered since about the first of June. The irregular actions of the muscles were limited to one side of the body and chiefly to the arm. Her general health was good. I prescribed for her fifteen grains of hydrate of chloral, to be taken three times a day. After three doses she was much more quiet; she continued gradually to improve, until, on the 16th, she was entirely free from any spasmodic movements. Subsequently she took seventeen doses of ten grains each. During the time she took the remedy, her sleep was more profound and of longer duration than it had been.

CASE IV. *Epilepsy.*—A boy, aged thirteen, to whom I had given the bromide of potassium, for epilepsy, without any material result, was submitted by me to treatment with hydrate of chloral. When the administration was begun he was having one or more fits every day. The hydrate of chloral was first given on the 21st of November, at 9, A. M., in a dose of twenty grains. At 2, P. M., he had a fit; at 3, P. M., he took twenty-five grains, and afterward he fell asleep; awaking about 9, P. M., he took another dose of twenty-five grains. He slept all night, and on awaking about 7, A. M., he took twenty-five grains. At 2, P. M., the dose was repeated, and again at 9, P. M. He slept at intervals through the day, and had no fit. Since then he has regularly taken seventy-five grains daily, and up to this time, December 6th, has had no fit. The influence of the remedy in controlling the disease is therefore very manifest.

I have prescribed it in other cases of epilepsy, but as the fits were not of such frequent occurrence as in the last case, I have not yet satisfied myself as to its efficacy.

I am also using it with decided benefit in a case of muscular tremor, simulating paralysis agitans, and in two cases of neuralgia.

Though my experience with the hydrate of chloral has not been very extensive, I am satisfied that it is a remedy of real value in a number of diseases of the nervous system.

ALVEOLAR ABSCESS.

[*Continued.*]

Swelling of the soft parts adjacent is usually well marked in the earlier stages of the affection, but often disappears as the abscess assumes a chronic character. In some cases the swelling is limited to a small area, nearly over the apex of the fang of the tooth which gives rise to it, but it sometimes extends over the whole side of the face, or, indeed, involves the whole face and neck, and not unfrequently interferes very seriously with the motions of the lower jaw, and even with deglutition.

It would not, however, be judicious to accept as true all of the extravagant descriptions of this formidable malady as given by the patients themselves, whose imaginations are sometimes so distorted by their sufferings that their history of the affection would do honor to Gulliver himself. We recollect well one of this class who stated that in his case the swelling of the face and head was enormous, and that it likewise extended to the neck, which was so swollen that the chin entirely disappeared, so that it was a level surface from the forehead to the chest; that after many days of untold suffering, being unable to see, or speak, or swallow, a sharp report, like that of a pistol, heralded the bursting of the offending tooth into fragments, after which the pain and swelling slowly subsided and the patient lived to tell the tale *himself*.

The pain is sometimes very severe, but is not proportioned to the amount of swelling. In the early stages of the malady there is usually first an uneasy sensation in the region of the affected tooth. This finally becomes a dull, heavy pain, and the tooth seems to be protruded from its socket, and, in fact, is protruded, to a certain extent, from its socket, so that in shutting the jaws closely together it strikes the antagonizing teeth too soon, thereby producing considerable inconvenience.

In exceptional cases the patient complains of no pain whatever, whilst the swelling alone testifies to the changes that are

being wrought in the various tissues, and in some cases the pain is extremely severe, almost unbearable, and this may be the case even when the swelling is but very little marked.

Redness of the surrounding parts is usually well marked in the early stages, but this usually disappears to a considerable extent. After an external opening has been effected and the contents of the abscess released, and in some cases, in consequence of peculiarities of temperament or diathesis, very little or no redness is observed at any stage of the disease. Increased heat of the parts implicated may perhaps be set down as an invariable concomitant, for though it has been frequently said that although redness and swelling, with heat and pain, are the most prominent symptoms of inflammation, still we may have inflammatory action without pain and without swelling, without redness or without heat. Still, later observations make it appear probable that an increase in temperature will be found to be always present.

After this *résumé* of the symptoms of alveolar abscess we shall be prepared to approach its pathological consideration. The symptoms enumerated above point unmistakably to inflammation as the pathological condition to be studied. Before entering upon this investigation, however, it will be necessary to take a view of some of the various structures that are more or less implicated in this process. J.

ROOT ENLARGEMENT.

Several times of late our attention has been forcibly called to what we, in each case, unhesitatingly pronounced exostosis, until Dr. J. D. Fahnestock, of our office, removed a right superior cuspid, with an enlargement covering about one-fourth of its root from apex downward (and about the size of root at neck), which enlargement was, at extraction, black as coal—the first we ever saw of this color.

Its whole appearance being a little remarkable, (the surface

resembling the prickly pear,) it was laid aside for microscopical examination; but in a few days was seen to be detached, and was easily removed from the root, which latter at this point seemed very much absorbed.

The patient, though afflicted with catarrh, is in fair general health, and does not know of ever having had trouble from this tooth.

Upon its removal, in the presence of three professional gentlemen, it was suggested as gangrenous. 'Twas *not* process.

Subsequent drying has enabled us to detach every such enlargement that we named exostosis, leading us to infer that the hypertrophied condition is of much more rare occurrence than is commonly supposed.

But how, Messrs. Editors, about the absorption at the apex of root, and whence the African color of this enlargement?

O. Willson.

Aurora, Ills.

[Cases similar to the above are not very rare, but they bear no relation to exostosis.

They are usually found in connection with absorption of the alveolar process, and the appearances described are produced by a deposition, probably of a calcareous substance, upon the root of the tooth. This is of various colors, sometimes almost or quite black, but commonly of a greenish color and usually of considerable density. Sometimes it clings closely to the tooth, and sometimes it is much more easily detached. We would refer the reader, who may be interested in this study, to the Transactions of the Eighth Annual Meeting of the American Association, page 41. J.

CASE OF DIFFICULT DENTITION.

Whilst travelling, a few months since, through the lower part of the county in which we now reside, we were accidentally brought in contact with a case which proved to be one of much

interest to me, and may be of interest to other members of the profession. The patient, a child sixteen months old, was suffering from a series of terrible convulsions—in fact, the attending physicians had despaired of the case, and left for their homes. The appearance of the child was exceedingly painful to behold. The spasms succeeded one another at short intervals. It appeared as if Death's Messenger stood near, ready to bear away the struggling spirit of the valued jewel, but was sufficiently generous to allow the parents one more lingering gaze. During the spasms the eyes were thrown upwards, features distorted, and the muscular system in general playing an active part, in order to photograph the severity of the pain within. As the case had been given up by the attending physicians, we had no hesitation in acceding to the requests of the friends to make an examination of the case.

We concluded to ascertain if the child's mouth had received due attention. The examination revealed an absence of the *centrals, also laterals of each jaw*, though considerable fullness existed at these sections, but no solution of continuity. The positions occupied by the anterior molars of both jaws were greatly swollen. Expressing our opinions relative to the cause of the suffering, and advising immediate lancing of the gums, we found the parents willing to accede to any suggestions tending to save the life of the child. Placing the child in the lap of an assistant, also taking the head in our own and firmly holding the same betwixt our knees, we proceeded to divide the thickened superimposed tissue, by crucial incisions, employing a round-edged blade; making our operation the more effective by keeping the edge in actual contact with the surface of the tooth. Learning that the bowels, though previously excessive in discharge, had been checked, we advised a laxative. The child was also placed in a tepid bath. With a few words relative to regimen, diet, etc., we traveled onward.

Being absent a few days, and not learning anything additional concerning our little patient, we called on our return. Imagine what was our pleasure when we found the "young hero," who, for fourteen days, had suffered greatly, eight of that number had

combatted death, in its varied terrors, now sitting upright in his cradle, amusing himself with attractive articles.

Re-examination brought to view the cusps of the two anterior molars of each jaw, also that of the left *inferior canine.* Two weeks subsequently the inferior centrals made their appearance, followed soon after by the superior ditto.

The citation of this case is not owing to the rare eruptional character ; but to show that there are occasions when the services of the dental surgeon may prove of most incalculable benefit, and may be called into requisition, when *wholly unaware.* Thus the *necessity* of diligent application to those difficult types of disease so prominent in childhood. BREWER.

Operative and Surgical Dentistry.

FILLING TEETH.

APPROACH TO THE CAVITY.

Case.—A small cavity, about a line in diameter, situated on the posterior cervical portion of the left upper second bicuspid, just exterior to the gum. From this point to the triturating surfaces of both the molar and bicuspid, the dentos is without discoloration or sign of decay. These two teeth are in contact nearly the whole length of their crowns. They ought not to be filed apart, and thereby sacrifice valuable dentos. Many dentists *do* file them apart and leave a V shaped opening. I object to these openings for several obvious reasons, which have been discussed time and again. They cannot be wedged apart to any advantage owing to the compactness of the dental arch.

HOW SHALL I PROCEED?

A drop or two of tincture of aconite is placed on the gum between the necks of the teeth, to be operated upon to obtund

sensibility of the gum. A small hickory wedge is then driven so as to compress the gum and remove it further from the cavity of decay.

The cavity is found about equi-distant from the buccal and palatal surface of the bicuspid. There is no room to manipulate even the smallest instruments between the teeth, without first cutting away dentos.

I shall make a groove or slot from the buccal surface to the cavity of decay, cutting it as deep as the present depth of the decayed spot, and making it of such a shape as to present, in section, a dove-tail. The sides of the groove need not vary much from the perpendicular. This slot is cut with very narrow chisels, having blades bent at a slight angle.

It is rapidly done with good instruments. The groove must have about as large a diameter as that of the cavity of decay. The latter is thoroughly cleaned and formed so as to be but an extension of the groove. Care is taken that the distal end of the cavity is slightly undercut near the bottom.

The next thing is to thoroughly polish the margins of this groove and all the dentos near it.

Now syringe the groove thoroughly with tepid water, until all particles of débris are removed.

KEEPING THE CAVITY DRY.

The wedge has compressed the gum. If it has loosened while preparing the cavity, it must be tightened. Two or three narrow and short strips of spunk are placed under the lip and above the teeth of the left side.

The teeth adjoining the bicuspid should be wiped dry with bits of spunk at the margin of the gum. If there are any loose gums from which water oozes, tuck under them small shreds of spunk to compress the vessels.

Wipe out the furrow or groove to be plugged, with cotton or lint, as they are easier removed than spunk from such an obscure cavity. It would not prove beneficial to the durability of the plug to have either spunk or cotton packed into the distal end

of cavity; especially if some portion of them projected beyond the margin.

A small dry linen napkin is laid over the under front teeth and lips, and over that a very thin one of rubber. The latter protects the plugger and gold from contact with a moist napkin, which does not show its condition readily.

INSERTING THE GOLD.

A round pellet of unadhesive gold, somewhat larger than diameter of the groove will be inserted and thoroughly impacted with a delicate *foot* plugger. Care should be taken that the gold extends beyond the slot, so that a good and perfect margin may be had at its distal end. As this is impacted, so must it remain, for any imperfection cannot be mended after a given point is passed by. The small *foot* plugger which is used should be turned about so that the toe shall press upon different sides of the furrow. I shall now impact with the mallet successive strips of No. 30 adhesive gold foil, against the soft pellet first introduced. These strips should be no wider than the diameter of the grooves. Wider pieces might be used, with safety, perhaps, but there would be some danger of *choking*.

As we will not be able to see the whole surface of the plug when it is finished, or even as we make it, great care is necessary that the *margins* are kept perfect all the time. The *foot* should slide along the margin and carefully condense the gold at this portion.

Fill out, at the last beyond the entrance to the slot, so as to have plenty of gold to remove in

POLISHING.

The gold between the bicuspid and molar must now be burnished down. Then trim it to a nearly level surface with the dentos.

Burnish again, and with a thin, narrow and delicate file work the surface of the plug down to *very* nearly the surface intended to be permanent. Now with a stick and polishing powder finish. I have formerly used pumice stone for polishing after the file, but Dr. Forbes brought to my notice a few weeks since an

earth called diamond dust, which, although having a good surface, cuts remarkably fast, very much as our Arkansas stones cut away steel, although they are of a fine texture. This article can be procured of Leslie & Co., of this city, and I recommend it as far superior to anything I have used for polishing.

After this powder use chalk and alcohol. CHASE.

MALLETS.

With the change which is taking place in relation to using the heavier numbers of gold foil, I find it necessary to change the weight of my mallet.

About two years ago I was glad to exchange my light wooden mallet for one weighing about seven ounces, and this I continued to use until I had become accustomed to the heavy foil. As I continued to manipulate the latter, I found that a much lighter blow was required for condensing them than for the light foils, and I changed my heavy mallet for a steel one, which weighed but 3½ ounces. I found this still too heavy, and going back to the original light wooden mallet, I find that I have a better blow than from the heavier instruments.

In the use of adhesive foil, we only wish to condense the surface of the plug; only to condense and unite the last piece of foil to the previous surface; and any force, exerted for this purpose, greater than is necessary to produce the desired result, is an injury to the plug, endangers the enamel at times, and is unpleasant to the patient.

A pellet of No. 2 adhesive foil requires a heavier blow to make it cohere to a plug surface than does a strip of No. 30 or No. 60.

Dentists who use cylinders must use a heavy mallet to condense them on their distal surfaces, and as I use cylinders nearly every day, I find my seven ounce mallet none too heavy for the work. In this case I wish to condense not only the surface of the cylinder next to the plugger, but its opposite exterior surface also. There, is, in these cases, a comparatively large mass of gold to be

condensed, and the blow from the wooden mallet makes hardly any impression on the cylinder, excepting on the exterior portion touching the plugger.

I am satisfied that I shall continue to use the heavy foils 30 and 60, until there is something new and better to take their places. No. 30 is still my favorite for the mallet, and No. 20 for hand pressure. Strips and squares are the forms in which I use those Nos., as has been before described in this Journal.

CHASE.

FINISHING FILE.

In very narrow spaces, when a thin and narrow file is desirable, I have found an instrument made for me by Spackler of this city just the thing.

A piece of steel seven inches long, is made very thin at the blade (as thin as a No. 1 Froid), which is about an inch long, and one-eighth of an inch wide. The blade has a slight curve on its flat side, and on the inside arch of the curve is file cut for about one quarter of an inch at the end. Another instrument is made cut in the same manner on the *exterior* arch. They are then brought to a *spring* temper. There is no danger of breaking them, and when dull can be sharpened. They are also safe sided. I have found these files invaluable in finishing gold plugs in locations not approachable with common files. They are peculiarly nice with which to work up under a margin of gum.

CHASE.

GREEN'S PNEUMATIC ENGINE.

This little instrument has very much lightened my labors in the last month. I have two dozen burrs fitted to it, which enables me to dress down the margins of my cavity to a smooth and even surface with little trouble to myself or patient. Equally useful is this simple instrument for dressing down and polishing gold plugs. I think I save a good half hour by its use on every plug I insert. I paid full price for my engine, and nobody pays for this notice.

CHASE.

Mechanical and Miscellaneous Department.

GOLD SOLDER.

In the Eighth No. of Vol. I., we published an article on gold solders, in which we gave formulas for solders of different degrees of fineness. Among them was one to which we called special attention as being the best. We allude to the one of which *pure* cadmium is a component. Since the publication of this article, we have furnished several members of the profession with solder made by the formula given, and all speak of it as superior to any solder they have used.

Having received many inquiries respecting the making of it, and believing it to possess many advantages over any other form of gold solder, especially for the uses of the Dentist, we answer our correspondents through the medium of the JOURNAL.

Cadmium in its chemical relations and reactions resembles zinc, with which it is found associated. It is more readily volatilized than zinc; thrown into a red-hot crucible it burns like it but with a brown flame, and is dissipated as the oxide. It is a white metal, resembling tin more than zinc in structure and color; is not as readily acted upon by dilute acids or the atmosphere as is zinc. It resembles zinc in forming brittle alloys with most metals. Its specific gravity is a little above that of zinc, being 8.6+. Fuses at 442°F.

Gold solder alloyed with cadmium compared with that alloyed with zinc is softer, more ductile and tenacious; fuses at a lower degree of heat; is not as light colored, resembling more nearly the color of the alloyed gold with which it is combined; the secretions of the mouth have less action upon it.

One of the most serious objections to solder of which zinc forms a part, is the shriveled appearance of the surface on the second application of heat. A gold plate soldered with an alloy

of cadmium may be re-heated any number of times, and there will be no perceptible change in the appearance of the surface of the solder. The cadmium alloy being more tenacious, a less amount is required to make the union equally strong.

As it fuses at a much lower degree than the zinc, or any other alloy of gold of equal fineness, a much higher carat can be used, which will flow equally well at the same degree of heat.

In making the alloy it requires some little care to prevent the entire loss of the cadmium by volatilization. The gold should be first alloyed with copper, or copper and silver, as you desire it. I usually alloy it as for plate, reducing it to about 21 carats. The malleability and tenacity of this alloy should be tested before adding the cadmium, by passing the ingot through the mill, reducing it to the thickness of heavy plate; when sufficiently malleable and tenacious to make good plate, the cadmium may be added in the proportion of 3 grains to the pennyweight. In order to protect the cadmium as much as possible from the action of the heat, lay it in a hollow formed in a piece of charcoal, and cover it with a piece of the gold alloy, throw the flame from the blow-pipe carefully on the gold until the mass is melted, and turn it off immediately into water, thus granulating it; place the remaining portion of the alloy in a clean crusible in a *clear* fire, adding only a small quantity of borax as a flux; as soon as it is melted add the cadmium alloy, a small portion at a time; when all is added shake the crucible for a moment and pour at once into the mould. If the quantity made does not exceed an ounce, it will not be necessary to granulate the alloy before adding it to the gold. Made in this manner, from one-half to two-thirds of the cadmium is lost, and if the solder be remelted, not more than one-fourth of it will remain.

EAMES.

TO CAST ALUMINUM PLATES.

From a plaster impression make a model of plaster and silex in the proportion of two parts plaster to one of silex; marble dust or pumice stone may be used in the place of silex. Make the

model plate, take the articulation, &c., the same as for rubber work. In grinding the teeth care should be taken to have the joints as good on the inner or lingual surface as upon the buccal surface. When they are all arranged the upper margin of the gums should be brought to a line by grinding the edge to nearly a right angle with the surface of the gum; place a thickness of ordinary letter paper in each joint before waxing up the case. When the case is ready for the flask pass the point of the wax knife between the wax rim and the edges of the gum, pressing the wax away about the sixteenth of an inch. The paper placed in the joints and this space made between the wax and the margin of the gums, is to prevent the blocks being broken by the contraction of the metal. The paper should be carefully removed from the joints, and the latter covered with narrow strips of tissue paper, so as to exclude all plaster, before flasking.

Flask the case with plaster and sand, equal parts. The coarser the sand the better, the object being to secure a porous mould. The flask has two tubes inserted at the back end, corresponding in position with the heels of the plate. The metal is poured into one of these tubes, passes round the mould and rises in the opposite one. When the case is set in the lower half of the flask the surface is oiled, the top part placed in position, and a small roll of wax, connecting the tubes with the heel of the plate, is placed in position, and the remaining portion of the flask filled. Open the flask without heat, remove every particle of wax without boiling or heating the case. Observe that every portion of the margin of the gum is covered by a thin coat of plaster to prevent the metal coming in direct contact. Dry the case thoroughly, and raise the heat of it to about 400° before pouring. The tubes should be heated to a dark red. The metal should be melted in an ordinary crucible without flux, or a little linseed oil or balsam may be used. The fire should not be too hot, and the metal should not be over-heated. As soon as it is melted place the hot tubes in position, stir the metal with an iron rod, and pour; let the case stand till cool before opening. Finish up the same as adamantine work.

A process similar to the above, I presume, has lately been patented, and flasks adapted for the purpose are offered for sale to licensees only.

I have seen no description of this process, but since casting plates as described, Prof. Judd has placed in my hand a letter from Dr. C. C. Chesley, of Pittsfield, N. H., descriptive of his method of casting aluminum plates, which probably is the one patented; it is about the same as the one described above.

EAMES.

PATENT HUMBUGS.

MR. EDITOR:—Please give me space in your valuable JOURNAL to say a few words relative to patent humbugs.

First, as to the Stuck & Owen patent. The agent for this patent process called upon me at my office, in Carlinville, for the purpose of vending me the right to use the same, and for which he would only charge me the small sum of $25.

I replied to the gentleman that I considered the thing a humbug, and did not wish to purchase. He then produced certificates from gentlemen—some of whom I am sorry to say, stand high in the profession—commendatory of the process. One of which, purporting to come from the Cincinnati Dental College, was well calculated to give character to the process, to say the least, and mislead the profession in regard to it. Not biting at this gilded bait, he left my office and proceeded to the office of my professional brother across the way, to see what could be done with him. In an hour he returned and offered to instruct me in the process for $15, at the same time trying to convince me that there would be a vast amount of labor saved by adopting it. I still refused to purchase, and stated to the gentleman that I did not want it at any price. He then returned to my neighbor across the way and struck a trade with him, the result of which, shortly after, appears in our county paper, under the head of a flaming advertisement, viz:

"*A New Improvement in Artificial Teeth, by Stuck's Patent Process.*"

Now, Mr. Editor, I pronounce the Stuck & Owen patent a swindling humbug, and it has been so pronounced by the profession generally. In the first place the letters patent of the gentlemen Stuck & Owen, covers but one point in the whole process, and that is relative to the use of the slitted impression cup, which, by the way, is not at all essential to the process, as it can be performed quite as well or better without it. And I would state here, for the benefit of those who have not had an opportunity of investigating the thing, that any dentist in the country has a right to use the so-called Stuck & Owen patent, by omitting the use of the slitted impression cup.

That part of the process relative to constructing metallic dies directly from plaster impressions, I, as well as many others, performed ten years ago. In the advertisement above alluded to, the public are informed that there is a great improvement in plates constructed in this manner, that they can be made much thinner, more uniform, etc., etc. Now, Mr. Editor, I contend that with a good set of burrs, and using my thumb and finger for a guage, that I can dress a plate to any desired uniform thickness, in the space of five minutes. If there is any advantage resulting from the use of this process, it is to the patents and not to the operator.

The advantage to the operator is on the wrong side of time, as it takes about two hours longer to construct a plate by this process.

How long must the public be humbugged by such clap-trap advertisements? So long as men standing in high places, and professors in our Dental Colleges, will lend their names to bolster up every humbug that comes along, so long will the public continue to be gulled by them. I, for one, protest against this sort of thing.

By the way, quite an amusing incident is related of Mr. Myers, the agent for the Stuck & Owen patent, and the President of one of our Dental Colleges, not a thousand miles from here. Mr.

Myers was in the office of one of the profession, at Memphis, advocating his patent. The afore-mentioned President happening into the office, was asked by the doctor in charge, what he thought of the Stuck & Owen patent? He proceeded to ventilate the thing; denouncing it as an "unmitigated humbug." Mr. Myers soon after took occasion to leave, without even attempting a defence of his patent, when the president was informed that the gentleman who had just left the office was Mr. Myers, agent for the Stuck patent.

Next under this head may be mentioned Dr. Goodall's Patent Elastic Spring Plate. The principle upon which this patent is based, was used and condemned long before Goodall ever dreamed of it. I have seen plates constructed on this principle nearly fifteen years ago.

Then comes the Reynolds' claim for a mode of attaching plate teeth to rubber base, by means of gold lining, soldered to the teeth and anchored to the rubber.

This method has been in use by the profession ever since the advent of rubber. The first set of teeth made on rubber plate, in the city of St. Louis, was made by myself and partner, Dr. Bennett, and was constructed upon this plan. Having been in general use for a long time, this method is unpatentable. Perhaps I cannot do better than to quote from the Dental Office and Laboratory, to express my views upon this subject. "If there is a class of men who deserve and receive our heartiest execrations, it is that class of men who, at this time, are afflicting us with their attempts to force upon us their so-called "improvements," in the shape of patents upon this, or that thing. In nine cases out of ten, their patents are upon methods which we used and discarded, before the patentees were born. A dentist, in the privacy of his office, thinks he has discovered something new in the way of arranging air chambers or dies, and straightway puts a shirt in his valise, and without a search to find whether his idea is patentable, hurries around the country attempting to sell his ideas to the honest and unsuspecting dentists."

The dentist who knows anything of his business knows that

this idea of vending dental patents, is a gross imposition upon the dentist, and a violation of the Code of Ethics.

I am glad to see that your JOURNAL has had the firmness and good sense to denounce all such humbugs from its first inception, and I hope it will still continue to do so. WM. H. CHAFFEE.

Carlinville, October 20th, 1869.

CHEAP DENTISTRY.

Upon this subject there has been considerable said, both for and against. The phrase has more meanings than one. First, Dental operations of the first order, performed for a small remuneration; this we may term *cheap dentistry*. Secondly, unskillful operations rendered with cheap materials; this we would call *cheap dentistry* in its full force. But each of these propositions may be modified, so that under the last one we may get good operations with cheap materials. But some will say that is *cheap dentistry*, therefore refrain from doing it. Now, while we are not a *devotee* of cheap dentistry in its broad sense, yet we find some good reasons for the above modified proposition.

There seems to be a disposition upon the part of most of our writers upon this subject to condemn all work done with cheap materials. Now, whilst it is a fact that all such work is cheap dentistry, does it necessarily follow that it should never be done? We think not.

Our experience in the West has taught us that there is sometimes some necessity for what we might term cheap dentistry of the first order. Although in some localities this necessity is not so apparent, yet it is equally true that it does exist in others. It does not necessarily follow that if my patient is not able to pay more than one or two dollars for one filling, that I must either dismiss the case, or beat into the cavity five dollars worth of gold, and charge two. Or if my patient is suffering with indigestion, in consequence of not being able to masticate the food

properly, and is able to pay but twenty-five dollars for a set of grinders — that I shall (if I do anything for him) make a plate of heavy twenty-two carat gold, well rimmed; yet this seems to be the argument of some operators who are favorably situated, with a class of people who demand nothing but the best material, skillfully worked (the standard sought.) We believe that every dentist wherever situated, should ever encourage his patients to appreciate this class of work. We believe that he is not free from reproach unless he does so advise and encourage.

But every country practitioner finds a class of people who are not able to pay for what we might term fancy operations, but they have teeth to save; hence we find a just demand for a cheap dentistry. Now, all this may be rendered, with some cheap materials, in a skillful manner, to the joy of the receiver and the credit of the dispenser.

The preparation of a cavity should be just as thorough for plastic fillings as it is for gold. It may not in some cases be so necessary for retaining points. But the removal of all the unhealthy dentine, and the restoration to health, should be just as complete. In the introduction and finish of the filling just as rigid rules should be observed, when in a majority of cases a dying tooth has been saved. The writer has seen even amalgam fillings that had been worn twenty years and bid fair for several years longer. But the work throughout had been well done. The same general rules governing the preparation and treatment of the mouth, and final adjustment of the finished set of teeth on gold, should be observed with any of the cheap bases.

It is a lamentable fact, that there is more botchery served up in working the cheap materials than in anything else. Some operators seem to get the idea that because the thing is to be cheap, it will warrant carelessness in its manipulation. The amalgam fillings and rubber plates seem to have possessed some very enticing invitation for this class af work.

The rubber, however, seems to have about spent its day. And

it is to be hoped that the day is not far distant when it will be entirely discontinued. But some dentists, from some cause, still continue to use it. We trust only, in such cases, where it can be worn with impunity, and then if well fitted and finished it answers a very good purpose; but, while it is difficult to tell what are going to be the results of each case, and as there are other bases believed to be much better, and about as cheap, why not abandon the doubtful and adopt that which is better? We are supplying our patients with *aluminum* as a substitute for rubber for entire upper sets, and partial ones, with a good account. This is *cheap* dentistry, it is true. But we conclude that the country practitioner, who has taken his cheap materials and used them with caution and discretion, well and faithfully worked them, has been of good service to suffering humanity, in preserving teeth that never would have been touched. And in restoring the lost grinders by artificial substitutes, enabling the wearer to perform mastication with the proper organs, thereby enjoying life, *hale* and *hearty*. Thousands of these living testimonies are there to the *truth*, that the country dentist has been faithful to his trust. Save all the teeth you can. If your patient is not able to pay for a first class operation, with the *best* material, and you can save the tooth with a cheap substance, *Do* so, and care not for him who would cry *cheap dentistry*. In conclusion, we would say to our professional brethren in localities so highly favored with a well paying practice, that inasmuch as there are not enough of such places to keep and support all the dentists, some of us must seek a country practice where we may be called upon for a cheap dentistry.

COUNTRY.

Kirksville, Mo.

STRAY THOUGHTS.

TO TEMPER FINE-BLADED EXCAVATORS.

With a pair of pliers, seize the handle of a broken Froid, or handle of any separating file; place over (not into) the flame

of a spirit lamp, hold the shaft of the instrument upon and as near parallel as possible with the long axis of the file, keeping the blade from actual contact with the same, and thus prevent those dangers arising from flickering of the flame, also thus secure a more uniform temper.

TO FILE AND POLISH THE SAME.

Employ a fine cork in your vise as a base to rest the instrument upon. The softness, also flexibility of this article, prevents those breakages so oft occurring; also very greatly reduces that unpleasant harshness of sound while filing.

IN ABSENCE OF SCOTCH STONES

We find the common slate or soap-stone pencils quite useful, if not fully as efficacious in dressing face of fillings; also for polishing the teeth after scaling.

CLEANSING OF OIL-STONES

May be facilitated by thoroughly warming the same, thus forcing the liquid in the stone through its pores, which moistens its surface, when it can be easily cleansed.

CATARRH.

To correct the disgusting and sickening odor arising from this disease, we ask our patient to indulge us by snuffing a small quantity of a disinfectant—one teaspoonful of "Phénol Sodique" or a few drops of carbolic acid to a tumbler of water forms an excellent article. We prefer asking this indulgence, even at the expense of "stunning blow," than to stomach "for a full-fledged hour or more this poisoning miasma," thus tempting us to slight our manipulations. We have tried it and know whereof we speak.

GLYCERINE.

Previous to our pumping process in treatment of alveolar abscess we bathe the parts adjacent with the above article. We employ it as top dressing when placing creosote within a tooth. If, while carrying a pledget of cotton, moistened with creosote or carbolic acid, to a cavity, it accidentally comes in contact with

any portion of the mouth, we immediately apply glycerine, which at once relieves the burning sensation and prevents any further escharotic action; though very particular are we that each pledget of cotton or point of instrument dipped in our glycerine be scrupulously clean.

WARPING OF PLATES.

By adopting the following rules, we have, so far, found poor grounds for complaint concerning the above perplexity: We take one part Plaster of Paris; two parts common coarse sand; we avoid imbedding too deeply; heat slowly, regularly and uniformly. After soldering, place case in a drawer and close. There allow it to remain till entirely cool. Rapid heating while damp, and sudden cooling while hot, are the prime causes of this trouble; although a fissure may occur while soldering, yet if allowed to cool very slowly, and protected from excessive drafts of air, that fissure very nearly, if not quite closes again. When systematic laws are generally understood and more thoroughly observed by those complaining, "rings," bolts, etc., and complaints will grow most beautifully less, BREWER.

Chilicothe.

THE AMERICAN JOURNAL OF DENTAL SCIENCE.

The February No. of this well-known Journal contains several articles of interest. The leading article is entitled Recent Histological Views as Regards Enamel and Dentine, by HENRY R. NOEL, M.D., Professor of Histology.

Commencing at the completion of the sacular stage of development, Prof. Noel describes the secondary histogenetic process very clearly, but differs, in some particulars, from the doctrines laid down by Tomes and Kölliker, following, for the most part, the peculiar language and description of Beale. Although describing the histogenetic process somewhat differently from the latter author, he arrives at the same conclusions so far as the most important points are concerned. The first point of divergence

from the commonly accepted doctrine is found in the statement that masses of germinal matter are found upon the external surface of the pulp, i.e., external to, and resting upon the tunica propria, which extend themselves toward the masses that proceed from the tunica reflexa; that these meet, and that the one forms the enamel organ and the other the dentinal organ, which, when calcified, form enamel and dentine. That a dentinal organ is formed external to the tunica propria will be new to many who have been accustomed to regard the process of dentinification as being carried on through the action of the cellular element which forms the periphery of the papilla or pulp proper.

According to the theory here put forth, the essential difference between enamel and dentine consists in the degree to which conversion of germinal matter to formed material has taken place, that while all of the germinal matter has been converted into formed material in the enamel, the central portion of the tubuli, or as he calls them, fibrillæ, still remains germinal matter.

Conclusion ninth to which he arrives, reads—Fresh dentine, therefore, has no tubuli, but has uncalcified fibrillæ solid, or nearly solid.

We must confess that we do not exactly understand why a set of hollow rods should be converted into fibrillæ, and declared not to be tubuli, because they are filled with a fluid or soft solid matter. Fill a hard tube with water, or with any other substance that does not blend with it and make a part of the solid substance itself, and it will not change the tube into a fibre, or in any way destroy its identity.

The twelfth conclusion, which expresses the opinions of Beale, is not in accordance with views generally held upon the subject. "Enamel and dentine are not vitalized tissues so far as the calcified portions are concerned. Enamel is dead—perfectly dead, &c.," does not exactly agree with the opinions one would naturally form from a careful consideration of a few points which are laid down by the author himself. When speaking of the enamel organ, he remarks, "this is the enamel's organic base." Now, if we understand by "organic base" vitalized tissue, would we

expect that this vitalized base would be *perfectly dead* as soon as some phosphate of lime and a few other salts were deposited among its elements, and is it moreover probable that this base of connective tissue, if it were dead, would remain unchanging and unchanged during a long term of years, forming not only an exception to the general law which dominates over all other soft tissues, but also militating against that high law which ordains that constant change is stamped upon every atom of matter throughout the universe?

If we were asked to furnish evidence that enamel was not dead—perfectly dead—we would point to the fact, that it is many times exceedingly sensitive to the touch, and that sensibility is one of the most certain signs of vitality wherever it exists. Can any one give as good a reason for supposing it to be dead?

The next article of the present No. is the conclusion of a series of articles upon the Microscopy of the Dental Tissue, by S. P. Cutler, M. D., A. E., D. D. S., of New Orleans, though this article is principally taken up with a discussion of forces, and favoring that view which affirms the correlation of the physical and vital forces.

Article Third, by W. R. Whitehead, M. D., upon an Extirpation of an Osseous Tumor of the Upper Jaw, has some points of interest.

In this case the floor of the orbit was removed without any serious disturbance to the eye. The cause of the tumor was attributed to a bruise *three years before* the tumor made its appearance. Microscopic examination showed only the usual osseous formation. It was, therefore, probably non-malignant, and consequently will not be apt to return.

Article Fourth, gives a report of the Georgia State Dental Society.

We are glad to see these evidences of an increasing interest in dental progress in all parts of the country, and we have no doubt but that this organization will be of signal service to the profession. The next meeting of this Socicty will be held at Atlanta, Georgia, July 28th, 1870.

Periodontitis, by J. Fred. Babcock, Bangor, Maine, extracted from the *Dental Times*, forms the Fifth Article.

In this case a lady had periodontitis, took a small dose of sulphate quinine, aromatic sulphuric acid and Elixir Calisaya bark, and the pain almost instantly ceased. The United States Dispensatory will need to be rewritten in view of the wonderful effects of this exceedingly scientific prescription for periodontitis. The *lance* was also used freely in the case at a subsequent visit. We had always regarded this as a formidable instrument, but supposed it was better fitted for the bloody work of a Camanche chief than for the benign purposes of a philanthropic and pain-soothing dentist.

Next follows an article from the *London Medical Times and Gazette* upon Necrosis of nearly the whole of the Lower Jaw, and a very sensible one, by J. G. Willis, M.D., of Cincinnati, upon Treatment of Tooth Pulps, the latter article extracted from the *Dental Register*.

We pass by several interesting clippings in the "Monthly Summary," and reach, under the head of Editorials, one from the *Canada Medical Journal*, upon the use of Amalgam of Mercury and of other Metals in Filling Carious Teeth.

As stated by the editor of the *American Journal*, in his review of this article, much that is said about the employment of base metals as filling for teeth is true, but we prefer to hear from the *Canada Journal of Dental Science* upon this subject, before we shall be satisfied that the "Royal College of Dental Surgeons at Toronto have recommended it for general use." Amalgam has much to atone for, but let no one discard amalgam on account of the mercury it contains, and still use vulcanized rubber plates. Both will some day, in the not far-distant future, be discarded by the best class of dental practitioners.

Under this head also we have, from the California *Medical Gazette*, extracted an Analysis of Mrs. Winslow's Soothing Syrup, which shows that the active principle in the syrup is "Morphia and other Opium Alkaloids," and a fatal case is recorded from taking this remedy.

Several other articles of interest are found in this number of the *American Journal*, and it affords us great pleasure to be able to state that we consider the *American Journal* as one of the very best among our list of exchanges. J.

REPAIRING ARTIFICIAL WORK.

Continued from Vol. I, Page 529.

When the fracture in a rubber plate extends under the teeth through to the front, adjust the parts as directed on page 528, and after burring the surface remove each piece from the plaster cast, and cut away the edges of the plate along the line of fracture, from a point just back of the teeth to the rim in front, thus forming an opening at this point under the teeth, one-fourth to one-half an inch in width; return the plate to the plaster cast, restore the form of the rim with clean beeswax, cover the burred surface with a piece of sheet-wax and flask the case as directed for repairing a partial plate; open the flask *without* the aid of heat, remove the sheet of wax, cut outlets for surplus rubber; boil the case for a few minutes in clean water, to remove the wax used in restoring the rim; soften some small bits of rubber, and pack the opening under the teeth; cover the burred surface with a piece of rubber, close the flask and vulcanize.

To replace a broken block or tooth with a new one:—Remove every portion of the old block without defacing the rubber; enlarge the holes in the plate, formed by the heads of the pins, to twice or three times their original size, by means of a thin flat burr, making them larger within than without; grind the block or teeth to fit all the surfaces of the rubber accurately; fill the holes in the plate with Wood's metal, or other fusible alloy; heat the block till the pins are hot enough to fuse the metal in the holes, then quickly press it into position and retain it there till the metal cools. Cases repaired in this manner are quite strong, and if neatly done look better than by any other method, and require much less time and labor to do them. If from any

cause we do not desire to adopt this plan the case may be repaired as follows: Remove with a file all the rubber back of the block, forming a dove-tail notch, and if there be much thickness of rubber underneath the block remove a portion of that also. In fitting the block be careful to have the edge of the gum fit the rim nicely; place the block in position and restore the form of the lingual surface of the plate by filling the dovetail notch with wax; flask, pack, vulcanize and finish in the same manner and with the same care as for other repair cases. It not unfrequently happens that a plate with one of the *front* blocks loose, or entirely broken off, is brought to us for repairs, and we find it impossible to replace the block with a new one, without the delay and trouble of sending away for one to match. If a *portion* of *two* of the rivets remain in the old block, the third one being broken entirely out, the block otherwise perfect, it may be advantageous to replace it, to avoid the delay and trouble of sending for a new one. It may be done by mending the two remaining rivets in the manner suggested for mending the rivets in a plate tooth. Having done this, with a thin corundum wheel make a perpendicular notch in the proximal surface of the end of the block where the rivet is wanting. Remove the old rubber back of the block and then proceed as detailed for replacing a new block. This notch in the end of the block, when filled with vulcanized rubber, forms a very secure means of attachment.

Should the case to be repaired have two or more blocks broken off, and the patient not being present to have the new blocks adjusted by trial in the mouth, the first step in the process of repairing should be the making of a guide by which to properly adjust them, and thus secure a correct articulation. This guide or articulator is made by simply oiling the lingual surface of the plate and teeth, and casting plaster over it to the depth of half an inch, having previously adjusted the old blocks and cast plaster on the palatine surface. When the plaster forming the guide is sufficiently hard, trim it flush with the outside of the teeth; it may now be taken off and laid aside till we are prepared to adjust the new blocks.

The Missouri Dental Journal.

A MONTHLY RECORD OF THE SCIENCE.

VOL. II.] MAY, 1870. [No. 5.

THE OBJECT AND AIM

OF THE SAN FRANCISCO DENTAL ASSOCIATION.

Read before the Association March 5th, 1870, by S. W. DENNIS.

MAN, unlike the rest of God's handiwork, is an intellectual, moral and social being, endowed with every blessing known to creation, the highest excellence of the animal kingdom, the key-stone of the whole universe.

We have given us all the advantages, without the disadvantages, that belong to the brute creation; and are we, with all these gifts, with every blessing that God, in his infinite wisdom, could "centre in our make," to move on like the wind, like the dog; live and die, simply because we are placed here to live and die; march on from month to month, from year to year, without contributing one atom to the great temple of wisdom and progress?

Are we to follow in the wake of the inactive and illiberal brothers, with no higher object in view than to increase the store of metal, at the expense of a regressive mind? Is there nothing higher, or more noble, than the mere effort to obtain that which fate has determined we shall not have — wealth? In other words, man, through his inordinate love of money, lends a quick ear to every speculative story, and, like the gambler, risks his money where the chances are against him, with the hope that he will become suddenly rich. Such a spirit corrupts the heart and demoralizes the soul, and perhaps robs society of an active and noble exponent of humanity, love and progress.

Of all the dentists in San Francisco, from 1849 to 1870, I do not remember many who for anything they have done to elevate the profession, would have a name worth the foot-stone to mark their final resting place, or who would be known for anything but their love of money, and the selfish means used in obtaining it.

Do dentists ever consider that, inasmuch as they elevate the standard of dental operations, they are serving the public, and at the same time promoting their own interest? For the better a dentist performs his operations the better and higher will be his prices; it *must* be so, it cannot be otherwise. The more confidence people have in dentists the more liberally they will patronize and pay them. Any dentist, however young, who wishes to learn, ought to be taken by the hand and encouraged, he cannot be kept down, and accursed be the spirit that tries it. I am informed by a very liberal dentist, of good social and professional standing, that he told a well-known and successful dentist among us, that he was anxious to learn, and he would like to see how he operated; that after soliciting the favor several times without success, he concluded the gentleman did not wish to let him see his "modus operandi." But, mark the contrast with the noble spirit in the East, of which I need not speak, but will read an extract from a letter I received from my friend, Dr. Lyon, of New York: "Why don't you make a visit to New York? It would pay you well. I can introduce you to all the best dentists, who will take you to their chairs and show you how they operate; no narrow-minded exclusiveness here. Come and stay a month, and you will learn enough to pay you well."

We cannot live always; we will be incapacitated by old age and death, and the least we can do is to bequeath to those who have decided to take our places, our knowledge and our experience, that they may be able to commence where we left off, and go on, instead of beginning at the bottom of the ladder.

THE ASSOCIATION.

We have a Dental Association in San Francisco; one that we flatter ourselves will, in the coming years, be second to none in the world; we have the material and the spirit, and all it

wants is the reveille to bring the profession to arms. Is there one in the profession in the United States, who reads the dental literature of the day, who doubts the elevating influence of Dental Associations?

It is neither convenient nor necessary to consult the historic page of our noble profession to give you the precise dates of the leading professional events. But the wheel of time, in its ceaseless motion, rolls on as before, until a quarter of a century has almost imperceptibly passed away since the organization of the first Dental Association in the world, and during that time the practice of dentistry has been elevated from a disgraceful, tinkering, catch-penny calling to the dignity of a noble profession, in whose ranks can be found the cream of society, and some of the best intellects in the land. When the noble fathers, who have gone before us, first conceived the idea of a Dental Society, the croakers, drones and barnacles threw water on every ember that showed signs of life, as some are wont and try to do among us. All Dental Associations have their influences for good, and there is nothing that we can do as dentists that is so well calculated to allay the spirit of jealousy among us. We will find confidence and friendship taking the place of distrust and alienation, which have existed and prevented the highest usefulness of the profession. We have organized this Association under the most liberal spirit conceivable; the great aim was to remove the obstacle through which other similar organizations have failed; that is, exclusiveness.

Some may say, and have already said, "I can get along without belonging to it." Others, that it will do them no good. As to the first idea I will say, *I* can get along without it, and I believe there is not one in the profession in this city who can not, but the question arises, how shall we best serve and gain the confidence of the public, and thereby promote our own interest and theirs in common? As to the second idea, that it will do one no good. Will dentists be so narrow-minded, so selfish, and conceited (sum it up in a nut-shell and say ignorant), that they are to do nothing except that which brings them in

pecuniary gain? Others say, "I cannot afford the time." I will ask if they cannot devote two and a half hours out of seven hundred and twenty toward the elevation of their chosen calling?

A distinguished dentist has beautifully said of professional intercourse, that "In the discussions here elicited you will find new illustrations of old familiar truths,—Knowledge is power; union is strength, and in a multitude of counsellors there is wisdom."

By the contact of mind with mind, both will be strengthened, and embryo ideas and theories will be developed into full maturity. There is magnetism in such contact, full of creative energy. Flint and steel are passive within themselves, but clash them together and they give out fire, and brightness dazzles upon the sight. The positive and negative poles of a battery never come together without a result. By friction of different mental organizations an idea is evolved, and a new law is discovered; a new creation is added to the wealth of knowledge, and the long-coming rays of a new truth, like those of a far-off star in the laboratory of heaven, reach and illume the world.

Members have been called upon, in alphabetical order, to give their observations and experience in writing, on some subject chosen either by the Society or themselves; they have done well. As to myself, nothing could be more foreign to my expectation and experience than essay writing. Had I consulted my own convenience, I should never have attempted it, but it was a duty I owed to the Association to try, and I have done so.

"Whatsoever thy hand findeth to do, do it with thy might." In the same spirit let us do our duty here. Some say, they do not wish to join this Association, because they will meet those they do not like; this is liable to be their own fault; perhaps they have practiced some unprofessional trick on some of their brother practitioners and are ashamed to meet them, or look them in the face.

This Association will remove those disabilities; dentists will not talk about their neighbors when they expect to meet them next day. Another dentist may say, I do not wish to as-

sociate with this or that one, because he is my inferior. I would like to ask such a brother if he is not too good to live in this world? For him, I would recommend some new city, in some new principality, and a new God, if he questions the wisdom or fails to comprehend the designs of the present one in placing him with us. But, Alas! how very, very soon might he find a beautiful republic beyond, and higher, full of people wiser and more magnanimous than himself.

MUSEUM.

When we are fully under way, or organized, we want a museum, or cabinet, wherein we can collect our precious curiosities. I think it was in 1863 or 1864, I extracted a tooth which was $1\frac{7}{16}$ inches long; my friend, Dr. Adams, took it to several dentists, to see if one could be found its equal. I left it carelessly about my operating table and shortly it disappeared. Had we then a Dental Association and Museum, this, among other curiosities, would doubtless have been deposited there. I would much rather the profession would have such things, than to trust them even with myself. It matters not how careful we may be with our specimens, death is liable to fall upon us at any time, and then those little collections, that we once valued so highly, are left to the care of the careless, who neither know their value or how to dispose of them.

LIBRARY.

We ought to have a library. There is hardly an organization in this city without one. There is not a word written upon the progress and science of dentistry, that should not be deposited there for our mutual reference. Since our organization I have felt the want of such a library very much. I find myself unconsciously brushing up, digging out from the cobwebs, works I never expected to see again.

THE MEDICAL PROFESSION.

In the Atlantic States, physicians bow with respect to dentistry. I find medical men as unable to give proper advice in our profession, as we are in theirs, and sometimes, more so; but few

of them understand the development of the teeth; also, few of them know that the six-year-old molars are permanent teeth; consequently are unable to give proper advice, when called upon so to do by parents and guardians. Sometimes, when their attention is called to the caries in these teeth, they say to the parents, "Let them go, they are baby teeth, when they ache, have them out."

Let us work hand in hand together against every obstacle the evil spirits may see fit to throw in our way; let us evade all side issues; let us see that no member makes use of this Association as a stepping stone to his own aggrandisement. We will not legislate how practice shall or shall not be obtained, but how it shall be best and most honorably done. Dental colleges do not endorse advertising or show cases as a means of obtaining practice; in fact, they discourage them as much as possible, but they do not say what the graduates shall or shall not do. And now in the face of these facts, shall we, a Dental Association, made up of a multitude of practitioners, of varied ability and ideas, proscribe members for their opinion? However unprofessional our way of practicing may appear to others, when we attempt to deal with a member otherwise than by moral suasion, I shall look for regression, discord and dissolution to follow.

CODE OF ETHICS.

I am in favor of a "Code of Ethics," that those who do not know what is honorable in the practice of their profession, may have an opportunity to learn. It might be read with profit at every monthly meeting, as the sceptical old woman said of the Homœopathic pill; "it will do no harm if it does no good." It is not necessary to have a penalty attached for the violation of the code, this simply drives away members whom the society might wish to benefit or elevate. It is our mission to elevate and educate. We will often find ourselves differing widely upon some minor points; as the poet says:

> "'Tis with our judgments as our watches,
> None go just alike, yet each believes his own."

But we will all agree upon the great fundamental truths of social and professional intercourse. Let us drink deeply of the fountain of love and truth, and then we shall prosper and grow wise. If a brother is rustic, then we must be urbane; if he is arrogant, we must be civil; if he is rude, we must be courteous; and then we shall all rise together like the great oceanic tide of Christianity, as it flows onward and upward, till it reaches its final goal.

ARE THE MINERAL ACIDS FORMED IN THE MOUTH?

By E. C. Chase.

I propose to take the affirmative of the above proposition, and I shall attempt to show that the powerful mineral acids, sulphuric, nitric and hydrochloric are formed in the mouth under certain circumstances; namely, when the food is allowed to remain around, upon and between the teeth day after day. They then are constantly being formed slowly, and in small quantities, to be sure. It is conceded by all who have given the subject any thought, I believe, that *organic* acids, such as *lactic*, *acetic*, etc., exist in the mouth, under certain conditions, in sufficient quantities to be detected. This is a well known fact and will not be denied, and it is not probable that they alone are the only acids which cause such disastrous results to the dental organs. It is true, the only positive evidence we have that nitric and sulphuric acids are ever present in the oral cavity, are the effects which they produce upon the teeth; but as for hydrochloric acid it has often been detected by reagents.

It seems to be a pretty well settled fact that dental decay is due to the action of certain *acids*, and if we knew to what acid or acids this action was due it would be an easy matter to apply the proper remedies.

I will now proceed to consider the action and formation of the different acids, and see if under any circumstances they could possibly be formed in the mouth. I will commence with

Sulphuric Acid. H_2SO_4. As its formula indicates, it is

composed by weight of two parts of hydrogen, sixty-four of oxygen and thirty-two of sulphur. A great number of the nitrogenous compounds, as albumen, caseine, gluten, &c., besides containing carbon, oxygen, hydrogen and nitrogen in their composition, have a trace of sulphur. If for example a fibre of meat is caught between the teeth and allowed to remain there a sufficient length of time, it will undergo decomposition, part of its hydrogen uniting with part of the nitrogen, forming ammonia, NH_3, its carbon uniting with part of the oxygen forming carbonic acid CO_2, and the sulphur combining with the remaining hydrogen forming sulphuretted hydrogen H_2S. Now, sulphuretted hydrogen, in contact with the oxygen of the air, is decomposed; the hydrogen uniting with the oxygen, forming water, and the sulphur set free. This sulphur being in the nascent state and having a great affinity for oxygen, is oxidized, and the result is *sulphurous acid* SO_2, which is converted rapidly into *sulphuric acid* in the presence of the water of the saliva; thus $SO_2+2H_2OH_2O_4S+2H$. The acid thus formed immediately acts upon the carbonate of lime, decomposing it, and charring the animal portion. This acid can neither decompose the phosphate of lime nor dissolve it. Therefore the latter, with the animal portion of the tooth, acts as a barrier, protecting the portion of tooth beneath it. It is probable that the "black variety" of decay, where but little of the tooth substance has been removed and the disinetgrated portion is tough and cuts like leather, is caused by the slow but constant action of sulphuric acid. The acid blackens the organic or animal portion of a tooth by its great affinity for water, therefore it causes a portion of the oxygen and hydrogen of the organic substances to unite, *forming water*, leaving an undue portion of carbon, which gives it its black or brown color. Owing to the small amount of sulphur which is present in the mouth under the most favorable circumstances, it necessarily follows that but a small quantity of sulphuric acid would be formed, and this immediately acting upon the teeth or some ingredient of the saliva, may account for its never being discovered in the mouth in an uncombined state.

Nitric Acid,—Symbol HNO_3, is, as its symbol indicates, composed by weight of one part of hydrogen, forty-eight parts of oxygen and fourteen parts of nitrogen; in one hundred parts we have, hydrogen 1.59—, oxygen 77.19+, nitrogen 22.22+.

It is commonly prepared by the action of sulphuric acid upon potassium nitrate; the reaction is as follows: $KO_3N+H_2O_4S=KHO_4S+HNO_3$. Nitric acid is characterized by its great affinity for bases and for its property of furnishing oxygen in its nascent state to oxidizable substances. It acts energetically upon a tooth, decomposing the carbonate of lime, setting carbonic acid free and forming the nitrate of lime and water, thus: $CaO_3C+2HNO_3=Ca2NO_3+CO_2+H_2O$. It cannot decompose the phosphate of lime, but readily dissolves it. It decomposes and destroys the animal portion of the tooth.

Thus we see that nitric acid removes each constituent of the tooth as soon as it comes in contact with it, either by decomposing it or dissolving it. This powerful acid is sometimes administered as a medicine, as is also sulphuric and hydrochloric; but probably not sufficiently often to account for its effects, which are constantly seen upon the teeth according to the observations of many practitioners. Watt says "It is the principal agent in the production of the 'white decay.'" By the putrefactive decomposition of any nitrogenous substance ammonia is evolved. And although nitrogen has a very feeble affinity for oxygen, yet under certain circumstances it combines with it, and forms several different compounds; and is it not reasonable to suppose that when some albuminous substance is undergoing decomposition in the mouth some of the conditions are present for the formation of some oxide of nitrogen? Although this has never been demonstrated, yet I think it very probable, for hundreds of chemical combinations and decombinations are taking place throughout the organism every hour that could not take place outside of the body except under entirely different circumstances; for instance, hydrochloric acid is found in the gastric juice; this must evidently have been formed in the body by the decomposition of some chloride, the chloride of sodium probably.

Now, to generate hydrochloric acid outside of the body by the decomposition of this salt requires a greater heat than that of the body. Suppose that an albuminous substance is decomposed and *nitric oxide* NO, is formed, which is not improbable; this coming in contact with the oxygen in the saliva is immediately converted into *nitric trioxide* N_2O_3, and this in the presence of the water in the saliva is decomposed into nitric oxide and *nitric acid.* The reaction is as follows: $3N_2O_3+H_2O=2HNO_3+4NO$. Thus by the decomposition of a particle of meat or a portion of the gluten of flour, or of epithelium we may and probably do have formed one of the *strongest acids.* Watt says that the ammonia which is generated "exposed to the action of oxygen is *always* decomposed, an oxide of nitrogen being formed, and of course *nitric acid* is the result."

Hydrochloric Acid. Symbol HCl., is as its, name indicates, composed of hydrogen and chlorine. The action of this acid dilute upon the teeth is very energetic. It decomposes the carbonate of lime, forming the chloride of calcium and liberating the carbonic acid; the hydrogen of the acid unites with part of the oxygen, forming water, thus $CaO_3C+2HCl=CaCl_2+H_2OCO_2$. The phosphate of lime is not decomposed but is very soluble in the hydrochloric acid and in this way is removed from the tooth. If the acid is strong some of the organic portion of the tooth is also acted upon. The action of the acid upon the teeth may account for that variety of decay where the inorganic portion is removed and the animal portion remains.

Now the question arises, how is this acid formed in the mouth? As I said before, it has frequently been detected by means of reagents. The chlorides of sodium and potassium are always present in the saliva, and it is undoubtedly formed by the decomposition of one of these salts, its chlorine combining with the hydrogen of the water; and thus the acid is formed. Again, if there were different metals in the mouth, such as gold fillings and those of amalgam; or a gold plate, and plugs of some other metal or *vice versa*, we would have galvanic currents which would readily decompose the water and the chlorides, setting the ele-

ments free, and each one would unite with the one for which it had the greatest affinities. Now, hydrogen being an *electro positive* element, and chlorine *electro negative*, their affinities for each other consequently great, they would unite, and the result would be hydrochloric acid.

The soluble chlorides are no doubt decomposed by other means which we may never be able to demonstrate. Probably no man would pretend to say just how every chemical change in the body took place. These are some of the mysteries which, it would seem, were not intended for us to know.

In this paper I do not wish to be understood as intimating that the decay of teeth is entirely due to the action of the mineral acids, far from it; but I do think they exert a great influence upon dental decay, and in some cases it may be that it is entirely due to their action. The action of the organic acids that are found in the mouth no doubt is about the same as the other acids, but much less rapid in their effects.

THE PAST AND PRESENT OF DENTISTRY.

Read before the Southern Dental Association by Dr. Benj. F. Smith, of New Orleans.

Mr. President and Gentlemen.—I have listened with pleasure to remarks illustrating the wonderful progress of dental art and science since I came upon the stage. I think we have reason to be proud of our noble profession, which I regret to hear some of our members designate as an "humble profession." That it was exceedingly humble when I graduated thirty years since, in the then little town of Erie, Pa., I freely admit—you are startled at the statement that there was a dental school at that early day, and I have no doubt you will claim for Baltimore the credit of the first Dental College. You are, no doubt, proud that you can boast of several Dental Colleges, each with eight

or ten professors, where aspiring youths are required to study three years before they are entitled to write D. D. S. after their names. Not so in my day. We had but one professor, and he was a man of such varied parts that he made a first class dentist of me in ten days. I see a smile of incredulity. If any one is so bold as to doubt my word I will produce his certificate that I was duly prepared to practice the art and mystery of dentistry. Gentlemen, that was the day of secrets and mysteries. In the course of my early career I purchased several, and I held on to them with great tenacity. In fact this was the only way we could show our superiority over the *quacks* that were then beginning to flood the country. But, gentlemen, if you are still incredulous, I will add another proof. If you will listen to me for thirty minutes, I promise to repeat all he ever taught me. I have still another. You all recognize Professor Atkinson, as the foremost scientific and practical Dental Surgeon in the world. He, sir, graduated in that kind of a school, and we commenced our practice together in the section bordering on Lake Erie. I will add another, and I think, a most convincing proof of my superior qualifications, and the claims of my *alma mater* for pre-eminence. In my course of preparation I had acquired an extensive list of high sounding Latin names, and the way I slung them out was very astonishing to the good people for whom I condescended to operate. I well remember the proud satisfaction with which I used such words as *Dens Sapientia*, *Central Incisors*, *Bi-Cuspid*, *Superior Cuspidatus*, *Ligamentum Dentis*, etc. Another proof that I fully availed myself of the superior advantages of that early day, may be inferred from the fact that I at once obtained an extensive practice, and in less than six months I had whole stacks of certificates from M. D.s, D. D.s, and professors of colleges, stating that I was the most skilful and accomplished Dental Surgeon they had ever known. True, many had never seen but one full fledged Dentist before, and he traveled through the South, where he made so much money that his neighbors shrewdly suspected that he must have added the profession of counterfeiting to that of Dental Surgery, or he could not have

purchased his splendid farm so quickly. I will add one more proof, which, I think, will satisfy you that my ten days collegiate course had fully qualified me for the wonder and admiration of those honest people, who were justly astonished that one small head could contain such an amount of scientific and linguistic lore, and whose hands possessed such an amount of cunning and skill. I actually manufactured several dentists myself in an equally short space of time, and I can truthfully say, that they were as fully prepared as myself to astonish other natives with their learning and skill.

I would like to compare some of the present methods of practice, with those of that day. There sits my worthy and venerable friend, Dr. F. H. Knapp, a veteran of thirty-five years practice, to whom belongs the distinguished honor of introducing the mallet for filling the teeth; and I, gentlemen, have the honor of being this first patient, or victim, if you please. I well remember the first complete set of instruments I ever saw, which cost the Doctor the large sum of $8. His stock for filling teeth consisted of about one pound of block tin; this he formed into plugs with his jack-knife, and with mallet and punch he drove them into my molars. To supply himself with teeth he made a raid into a butcher's yard and drew them from the lower jaw of a calf that had met an untimely end.

You are justly proud of the two dental chairs that have been on exhibition. They are certainly marvels of ingenuity and skill, elegance and comfort. You must not ignore, however, the chair of my day. It certainly had the merit of simplicity and cheapness, and was all that we then desired. It consisted of two common chairs. In the one we placed the patient, and one foot on the other; our knee formed a most inconvenient head-rest. I soon made a notable improvement on this, and only missed a fortune by neglecting to patent this marvel of ingenuity and simplicity. I used a common wash-tub on which I placed a rocking chair. By sliding the chair back and forth I secured the desired position. You cannot fail, gentlemen, to give me credit for the profound discovery that the said wash-tub

had two ears, and that the perforations through those ears were most perfectly adapted to the binding of the aforesaid chair to the said tub, and thus assuring a substantial basis for the impending operations. This would unquestionably have entitled me to a patent.

I will next allude to or compare the present with the prices of the good old days when everybody was honest. We had wholesale and retail prices. A single filling of tin was fifty cents at retail, and twenty-five cents at wholesale, and gold fillings were double that price.

Amalgam fillings were introduced about that time by the celebrated Crawcours. I purchased the secret, and presently acquired great skill in the plastering art. I also made the profound discovery that from ten to twenty fillings would sometimes produce salivation.

In 1843 I settled in New Orleans, and after many misgivings, adopted the then current price, three dollars for an ordinary filling. My friend, Dr. Atkinson, learning that I was charging this extortionate price, very naturally concluded that I must have left my conscience at the North. But times change and we change with them. On a visit to New York last summer, I was delighted to meet my old time friend, who soon initiated me into the modern system of malleting and charging by inserting for me one filling, for which his regular charge is $500, and three others at from $80 to $120 each. I was slightly startled at such a giant stride in progess. But there was no ground for questioning the fact, and I was seriously assured that it was directly sanctioned by Angelic Inspiration. I shall not be so bold as to deny the proposition, but I shall affirm that Dr. A. is the prince of good fellows, a thoroughly educated scholar and scientist, and the originator of many valuable improvements, and richly deserves the gratitude of the entire profession, and the extraordinary fees his wealthy patients are able to pay him.

I will close by offering two pieces of advice:

First—Do not attempt to conform your fee bills to those first

mentioned. You cannot hope to succeed. Leave us alone in our proud pre-eminence. We lived in a day when the "auri sacra fames," the infernal thirst for gold, had not permeated the entire social mass.

Second—I cannot conscientiously advise you to imitate our friend, Dr. A., in estimating the value of your labor and gold at $1920 per ounce. No, not even if you are so fortunate as to secure the constant attendance of two celestial advisers. I cannot seriously advise you to surrender your judgment and manhood to the dictum of some unseen, intangible presence. How can you know but that the ghost of some departed rival Dentist is bent upon doing you mischief, and appears for this purpose in the garb of a friend and angel of light. He may flatter your vanity, and tickle your fancy with the idea that you are made of so much finer materials than ordinary mortals, that you are permitted to hold communion with the progressed in other spheres. Your particular angel may prove a fallen one, who has assumed the roll of mentor and adviser, that he may work your injury by inducing you to assume the ridiculous position of being run by invisible engineers from the Great Beyond.

ALVEOLAR ABSCESS.

[*Continued.*]

The principal structures involved in this disease are, the tooth pulp, the peridentium, the periosteum of the alveolus, the osseous structure of the alveolar walls, the external periosteal covering of the alveolar process, the gums and the mucous membrane covering the parts in the vicinity of the abscess.

The pulp is made up, first, of a fine connective tissue basis in which are distributed a rich plexus of nerves and vessels, with more or less of cellular elements, or as Kölliker calls them, free nuclei, and it has been stated by Bòll that non-striated muscular fibres are also found entering into its composition as one of its

histological elements. Taking into consideration the fact that it is, under certain circumstances, extremely difficult to distinguish between pale nerve fibres, elastic fibres and non striated muscular fibres, it will be necessary to establish this by an abundance of direct testimony, before it will be generally admitted to be true, and this distrust will be heightened by the fact that it can scarcely be conceived that muscular fibres in this location are required for the performance of any functional activity.

Fat globules are sometimes found among the tissues of the pulp, but it may be that it is a product of disease, a fatty degeneration of some of its elementary parts. The periphery is composed of cellular elements, cylindrical in form, with the long axis of the cylinders pointing towards the walls of the pulp cavity, and sending processes into the dentinal tubuli. The periosteum of the alveolus is continuous with the periosteum of the external surface of the alveolar process, though differing somewhat from the latter in its histological characteristics. In the first place it is much thinner and more delicate, and the fibrous appearance which is usually so plainly marked in the external periosteum is usually entirely wanting, as is also the elastic fibres which are found quite abundantly in the deeper portions of most periostial structures. This, reflected upon the fang of the tooth, forms the peridentium, which does not differ materially in structure from that part of the membrane which lines the inner surface of the alveolar walls. As the peridentium has neither fibres nor cell formations, in the normal state, it may be said to be made up principally of homogeneous connective tissues, or as Albrecht describes it, as a homogeneous granular mass; and he further states, that whenever fibres or cells are formed in it, they are the result of pathological changes, and intimates that when this membrane is hypertrophied, fibres and cells may be found in its structure. Vessels and nerves pass through this membrane to reach the bony covering of the roots of the teeth, thus supplying the cementum with nutrition and innervation. The alveolar walls are made up of tolerably compact bony structure, but less dense than is found in some other locations. They

present no specified characteristics, aside from those of bones of the same class found elsewhere. The periosteum proper, of the alveolar process, differs in no respect from periosteal structures elsewhere, being a strong dense membrane, the connective tissue base of which is of the fibrous form, richly supplied with veins, arteries, nerves and absorbents, and with a very considerable admixture of yellow elastic fibres, these last being in greater abundance the nearer we approach the bone.

Operative and Surgical Dentistry.

HEAVY GOLD

FOR FILLING CAVITIES IN TEETH.

Dear Brother Judd: — Being somewhat acquainted with the dentists and dentistry of this country, I the more readily, (at my earliest leisure since receiving your letter,) consent to send you some thoughts upon "Heavy Foil."

The prevailing desire to be *regarded* as learned and dextrous rather than the undying purpose to be truly learned and efficiently dextrous in the dental practice, has stood like an evil genius in the way of growth in knowledge and skill.

The burthen of the call from pupils and practitioners has been, "Show me how to do it," rather than "who will or who can point out the principles that of themselves indicate the correct procedure to attain the highest results in dental practice."

It is in vain for us to esteem ourselves a profession unless we stand ready to ignore the former and present greatest heresy in our body; that is, taxing every power of body and mind to attain executive ability, or mere skill, while persistently refusing to seek the philosophy that underlies, and out of which the knowledge grows, that teaches when, where and why we should operate at all.

The history of our body as a profession is like that of the race, the nation, the community and all the sub-divisions of these parts of a grand whole, marked by a serial order of development to the highest perfectibility possible to each. And the department that refuses to fulfil the requisite obedience to attain the fullest measure of projection and pronouncement, whether from ignorance or willful conservatism or opposition to progress, will, after the example of the extinct varieties, species, genera, professions, peoples, nations, races, &c., &c., be forced to give place to existences that will sweetly accord in the universal harmony in consentaneous attainment of highest possible destiny.

All perfection of individual existences, processes and methods, is dependent upon the plan of presence and purpose, and under the laws of *production*, *construction* and *destruction* of the successive phases of presentment. That which is lowest and least complicated in constituency being the first in the order apparent to observation, and that which is highest and most complicated resulting upon the cancellations of the primary into the secondary and these into tertiary concatenations and interblendings of the lower discords into the higher harmonies in body and mind, which latter are apprehended only after acquaintance with the former. It is only necessary to refer to the past history of planetary existences, mineral, vegetable and animal, to verify the statement and prove it a law, that each has its deciduous, adolescent, culminative and decadent stages of appearance and disappearance in the genesis, growth and regenesis of substance and shadow, or reality and representation.

The history of the preparations of gold for filling cavities in teeth, has been, like the teeth themselves, a progress of stages of development. And to tarry in any one of these would be as fatal to the desired attainment as it would be fatal to the completeness of the teeth to spend all the developmental force in the production of a single element of the teeth; say, enamel, dentine or cement. It seems easy to the unscrupulous, after the recording and promulgation of this history, so that it may be read in a short time, to claim that they "always knew all about it," and

"supposed that *everybody* regarded gold as *adhesive*," and that they "never used any form of gold for filling teeth without annealing it in the flame of a spirit lamp," &c., &c., to the end of the chapter of "New Methods and Means," to all but these illuminati who can never be caught under conviction of any sense of the least deficiency or need — these impersonations of knowledge and skill! But to be *really in need* and to have a *sense* of that *need*, are very different states of apprehension.

Patient, faithful scrutiny of ourselves and others, however, will ultimately reveal to what dominion each one is the subject. It is of less consequence to us as a profession to ascertain just what particular stage of progress marks the mean of our status at present, than to be indubitably convinced of the conditions of knowledge and skill that are the measure of highest possible perfectibility within the reach of the most able and faithful among us.

Were each member of the profession required to write out his own rise and progress upon the question of heavy gold or light gold, as he has developed, we should even then fall short of all the undulations of light and shade that have contributed to our present position.

That which is usually denominated "accident" has been more apparent in contributing to the advances and regresses of my own particular career in this and other respects, than serial reasonings and efforts at discovery. That which I regarded as a misfortune at the time opened my understanding to the superiority of heavy over light masses of gold for filling cavities in the teeth.

It was by holding a rope of gold foil in the blaze of a spirit lamp to render it as sticky as possible, that it collapsed into a wiry kink at one end; endeavoring to secure that not so collapsed, it was carried to the tooth hot and stuck to the mass already packed, and when this portion was secured, the desire to use the "spoiled rope" induced us to bend back the wire into the depth of the cavity and force it into place by heavy blows with the mallet. Expecting to see it resist and behave badly, our

surprise will not be wondered at when we saw it come kindly into place and stick so firmly as to make it impossible to remove it by strong pulling to place it more to our mind. Finding it determined to stay it was literally mashed and pushed into the corner and side of the cavity, thus revealing its plasticity and tolerance to manipulation, and utilizing that which was regarded as doomed to the bottle for "foil scrap." Doubtless all will admit the greater strength of the heavy over the light forms, whether in single or manifold layers.

The native toughness of the gold is not only not reduced, but enhanced by the working down of the plates from the ingot. But at what exact point the highest tenacity is developed has not yet been proven.

Probably the very highest degree will prove to have been attained in case of drawing the ingot into wire of a given calibre, and then this wire or bar (for it doth not yet appear whether the round, square or flat form shall prove the strongest), reduced to the required thinness to accomplish the highest results in manipulation.

The manner of refining, annealing and reducing the gold has doubtless more to do with its fitness for our use than those who prepare it for us are ready to acknowledge.

Jealousy among gold-beaters, like the same inglorious sentiment among dentists, has stood and yet stands in the way of rapid and uniform progress and improvement.

This question has engaged so much of my time and thought, and has been so often repeated and re-repeated in conversation, discussion and writings, that it seems marvellous that it is still necessary to go over the simple statement of facts that indicate the philosophy of the process and result of preparing the cavities and the gold, inserting and finishing the substitute for tooth substance that has been lost, to secure the redemption that all admire and most seek to attain if possible, without cost in mind, body, time and money. It requires more earnest study than many are willing to give to enable one to comprehend and clearly state the questions, the solution of which alone can en-

able us to understand the principles and practice that all are so anxious to possess and exercise instanter by spontaneous effort, rather than by the slow growth of repeated trial and failure before success is attained.

Please bear with me then, when I adjure each one to shrink from no pertinacity and persistency of effort in trying, until you know for yourself and patient the transcendent superiority of "Heavy Foil" in all forms of cavities, large and small, simple or compound, and let me assure you that your efforts will not have been made in vain. ATKINSON.

April 19th, 1870.

REPLACEMENT OF LUXATED TEETH.

There seems to be a great diversity of opinion among authors of dental literature as to the propriety of replacing dislocated teeth; one contending that the operation is almost certainly to prove a failure,* while another, whose opinions are fully as reliable, takes the opposite grounds.†

It is evident that this question must be answered by the successes or failures which have attended those cases in which the operation has been performed.

If from a given number of cases a majority have been successful, then it is the duty of the dentist to consider the matter, and to practice the operation whenever he thinks it desirable, and if he is in doubt, "give the patient the benefit of the doubt," and replace the teeth.

Of course the success or failure depends to a great extent upon the amount of injury done.

A person might fall or receive a blow that would not only displace several teeth, but would also fracture the jaw to a greater or less extent, and lacerate the soft tissues so as to cause exten-

* "Harris' Principles and Practice of Dental Surgery," page, 414.

† "Tomis' Dental Surgery," page, 612.

sive inflammation and sloughing of the parts. In such a case the chances would be that the operation would prove an utter failure. But when teeth are knocked from their sockets, and very little, if any, injury is done to the alveolar processes, or when teeth are extracted by mistake, I think that they should always by all means be replaced.

Severe pericementitis may supervene, and must receive the ordinary treatment for that disease. It may be necessary to give the dislocated teeth some artificial support, until their connections are again made, and the teeth firmly held in place by nature. If anything is required, probably ligatures passed around them and attached to the firm teeth, would be as good as anything, but in a large majority of cases, nothing would be required to hold them *in situ*, if the patient will use a little care.

I will now give two or three cases that have been related to me by the parties within a month. Mr. M., aged about 40, general health always been pretty good, was in my office a few days since, said that *twenty-eight* years ago, while swinging, he fell and struck his face upon the ground in such a manner as to knock out his four superior incisor teeth. The thought occurred to him to replace them at once, so picking them out of the dirt and *wiping* them off, after several unsuccessful attempts in getting the right tooth in the right place, he finally succeeded, much to his delight.

After some soreness, which lasted only a few days, he said "they got well," and were firmly united again, and have been doing good service for more than a quarter of a century. I took particular pains to examine them in order to ascertain if the pulps were living, as the teeth were not discolored. I concluded before my examination that they had retained their vitality, and this proved to be the case; therefore, the vessels must have reunited at the apices of the fangs where they were torn off.

Again, a physician of this place, in attempting to extract a first right inferior molar for a young man, about eighteen years

of age, a few days ago, brought out also the second bi-cuspid adjoining. He immediately replaced the latter, but found it was *too long* and prevented a proper occlusion of the jaws; concluding he had it in the wrong position, reversed it and it went home.

Periostitis followed for several days, but the inflammation soon passed away, and at the present time the tooth appears all right.

This same physician, who by the way is a young man and has had but a few years of practice, tells me that he has had similar accidents occur before and always replaces the teeth with good success.

One more. Mr. B., about thirty-five years of age, says that when a young man, a medical student by mistake extracted a second lower molar for him, in place of a wisdom tooth, which he wished to have out. Upon his reprimanding him for his carelessness, the latter said, "no harm done, I will put it back," which he did, and the tooth has done good service for half a score of years or more. And so I might go on and relate several more cases, every one of which proved a success, but I think the above will convince the most sceptical that it is better to return the displaced tooth to its socket and run a little risk, than to do nothing.

It is very seldom that the dentist is called upon to perform the operation, unless it might be through some mistake he makes himself in extracting the wrong tooth, for whenever a person has a tooth luxated, he will most likely replace it himself or allow it to remain out a sufficient length of time to lose its vitality, in which case it would be, of course, utterly useless to return it.

How long a tooth will retain its vitality out of the mouth is a question which I am not aware has been decided. In case the tooth had been out several hours I should favor drilling into the pulp cavity and removing the contents and filling it and the root canals with gold before the tooth was replaced.

If any one of your readers can offer any testimony either

pro or *con* in regard to the operation, I for one should be glad to have them report in the "JOURNAL."

E. C. C.

IOWA CITY, Iowa.

FILLING TEETH.

Case.—Right and left upper second bi-cuspids show signs of infantile disease. The enamel on the buccal surfaces is black and looks as though it had been chipped off from centre cusp to the gum. It is rough, and of a chalky consistence. The grinding surfaces are pitted, furrowed, creviced, and black also. There is very little actual decay about these teeth, but they are unsightly, and will wear away rapidly on their triturating surfaces. Patient is a young lady, twenty years old.

TREATMENT.

I shall cover the buccal and triturating surfaces, entirely, with gold, and as these teeth are so shrunken as to be too short to occlude with the lower teeth, I shall build them down.

PREPARATION OF SURFACE.

Cut away all portions that are chalky and secure a foundation of harder dentine. I find the Pneumatic Engine does this admirably, with its rapidly cutting burr. Around the margin of the buccal surface I cut a slight groove. Make a few retaining pits with a drill at different angles on the triturating surface.

Place the rubber dam securely. Plug retaining points with No. 30 adhesive foil, well malleted home, so as to give *strength* to these *anchors* of the plug. We must remember that these anchors must be able to resist all the forces of trituration; not only the *vertical* force in mastication, but the lateral motions, which are much more liable to move the plug.

I use nothing less than No. 30, with which to build the whole of this plug. I can work it better than No. 60. I find that

even three thicknesses of No. 30 can be more easily adapted to a surface than one thickness of No. 60 in "building out."

Case. — Chemical decay, producing a deep and narrow cut just at the gingival margin of the enamel, extending only across the labial surface of the right upper central incisor. The cavity extends a little under the gum after preparing it for plugging.

PREPARATION.

The softened dentos is all removed. The margin of the enamel is found to be slightly undercut. This margin is made an even continuous line, so as to present, when plugged, a clear cut border of gold. The gingival margin of the cavity is very carefully prepared so that no rough edges shall be left, or a particle of softened dentos. Neither is a sharp edge left to be broken down by the plugger when inserting the gold. The two ends of this cavity are deepened a little and slightly undercut.

The gum is healthy and firm and does not *weep*. If it did I should cauterize it before inserting the gold. All gums weep *a little*, and I should not dare to attempt to plug this cavity with adhesive gold, entirely, without putting on the rubber dam.

From the fact that the cavity extends so much under the gum, the dam could not be placed without dissecting away the gum; this I sometimes do, in more difficult cavities, but this is not one of the latter. And in these notes from month to month, I do not select always the most difficult cases.

This tooth can be readily plugged with cylinders, and without the dam.

Make small cylinders or tightly wound cut rope of No. 4, Abbey's soft foil, of a diameter no greater than the width of the cavity. Have some strips of No. 30 *adhesive* foil ready. Syringe out the cavity with warm water. Dry it. Wipe it out with kreosote, touching the margin and underside of the gum. Place some *very soft* strips of spunk between the gum and lips. Wipe out the cavity with soft shreds of spunk. Avoid pressure on the gums with the fingers, while placing the gold, as you will

dislike to *cause* the gum above the cavity to weep. Place a soft shred of spunk at the apices of the gums on each side of the incisor, and gently press it under the gum to absorb moisture. The almost imperceptible moisture that crawls along the margin of gum from distant parts, must always be detected and avoided, and *prevented*, if possible.

Now, take the first cylinder and carry it to the distal end of the cavity, and press it firmly but gently home. Be careful that it does not move either now or when you place the next beside it. Press towards the *gingival* wall and put another smaller cylinder between the last one and the enamel wall, or else pack enough No. 30 adhesive foil in the latter place to make the gingival cylinder stand firm.

These cylinders must be long enough to project beyond the margin of the cavity, and when under the gum lift it up a little. Condense the cylinders by steady hand pressure, as the sudden blow of a mallet will be likely to start the gum to weeping. Occasionally touch a bit of spunk to the overhanging gum, to be on the safe side as regards moisture. I prefer to have a single line of cylinders under the gum, well compacted and held *in situ* by a small quantity of No. 30 adhesive foil, at the bottom of the space between the cylinders and the enamel wall. After the gingival wall is well secured by gold, there will be no danger of moisture from the gum, as the latter will be thoroughly compressed.

We can now use the mallet in compacting the No. 30, and after the cavity is full, compact with the mallet also the ends of the cylinders. Go over the whole surface thoroughly with a small "foot." Then file or burr down until the foot-prints are eradicated. Mallet again with small point not serrated, or at least only roughened, and do it thoroughly—thoroughly, and minutely. Burr or file it down again. The thin and narrow files mentioned in the April No. are "just the things" to finish the portion of the plug under the gum.

There is considerable gold overlapping the gingival border which must be removed. If it remains it will cause irritation of the parts.

Carefully make the gold margin and the cavity margin correspond; and be sure to polish this hidden surface of the plug, as well as you do the exposed one.

If the operation has been well performed thus far, there will be no need of a burnisher to make a handsome surface to the gold. It will need no burnisher. I would not leave a burnished surface on it, even if it is burnished. It will be more *presentable* if polished with powders, as it will not be so *glaring*. "Diamond dust," or pumice stone first, then chalk with alcohol. CHASE.

Mechanical and Miscellaneous Department.

CHEAP BASES.

The question, What shall we use as a substitute for rubber, as a base for artificial teeth? has perhaps received its full share of attention at our hands during the past year; still we feel there is no subject in which a majority of the profession is more deeply interested; we, therefore, take the liberty of copying from the April No. of the "American Journal" the following editorial on Weston's metal:

"*Weston's Metal.*—We have tested this metal in the case of entire lower sets, and are inclined to the belief that it is superior to anything of the kind which has yet been brought to the notice of the profession. We advise a trial of it by those who find objection to the lighter materials, such as rubber for example, or to the heavier materials, such as the pure tin base; as it is claimed for this metal that a plate of it when finished need weigh no more than one of gold.

"There is no doubt but that it is stronger, and will keep its color better in the mouth than any of the cast plates which have been in use, except perhaps aluminum, which can only be used in this way

combined with an alloy of tin and silver to connect the teeth to the plate.

"The following instructions are given for casting Weston's metal: 'Suppose the case to be a full Lower Plate of Gum Teeth,— those intended for Rubber are the only ones adapted to this work. Grind off the thin edges of the Gums, (that part intended in Rubber work to be covered by the rim or band) to a *right angle* with the Labial and Buccal surfaces of the Teeth; the object of this is to prevent the Gum cracking by unequal expansion or contraction. Next upon a cast made of equal parts of Plaster of Paris and clean pulverized Soap Stone, (Whiting, Pumice Stone, or clean fine Sand will answer as a substitute for Soap Stone,) arrange the Teeth in Wax, *precisely* as you would have them when finished. In *grinding the joints*, bring the body of the Gum squarely together, as closely as at the edges *Avoid using too much Wax.*

"When finishing with Wax, be sure to *cover the pins well;* and in arranging it for the rim, be careful *not to let it overlap* the Gum. By cutting away all superfluous Wax, and taking pains to make the Wax Plate perfectly smooth, much time and labor can be saved in polishing the piece after it is cast. The plate now being ready for the Flask, invest the same as for Rubber, in equal parts of Plaster and fine clean Sand. The Flasks used for Rubber will answer, by cutting with a coarse half-round file an opening five-eighths of an inch in diameter in the posterior part of the Flask, for a Gateway. Cut a smaller hole in the opposite side for a vent. When the Plaster in the Flask has set, warm it before opening, so as to soften but *not melt* the Wax; open the Flask and remove as much of the Wax as possible without marring the Plaster. After doing this in the usual way, any Wax that remains must be washed away by pouring boiling water into the Flask. Next cut a funnel-shaped Gate in the Plaster, through which to pour the Metal; this may be one-fourth of an inch in diameter, where it opens in the Mould, directly posterior to the last Molars; the Vent to be one-half the size of the Gate and directly opposite it. *Dry the Flask thoroughly* from three to five hours; it must not be used till perfectly dry. Any moisture remaining in it can be easily detected by holding a mirror over the venthole. Now melt the Metal carefully in a clean iron ladle,—*do not get it too hot; with the Flask heated so that it can barely be held in the hand*, pour the Metal. When quite cooled, open the Flask and remove the Plate.

If the piece is as it should be on coming out of the Flask, it will require little or no scraping or filing; use Sand Paper first; next Felt Wheels, and Pumice Stone; and finish with Felt Wheels, and the very finest Brush Wheels and Whiting.'

"These instructions, carefully followed, are applicable to partial Upper and Lower Sets, Plain or Gum Teeth.

"To replace a broken block, cut out the broken pieces and fit the block the same as for Rubber work; fill the dovetail with Wax; invest in Plaster and Sand; open the Flask; wash out the Wax; cut a Gate and a Vent; dry carefully; then heat the case to 200° or 210° Fahrenheit. Now pour the Metal in the Gate. If the Gate and the Vent are large enough, and the case properly dried, the piece when finished will be as good as new.

"A plain or single Gum Tooth may be attached when broken off, or added anew, by investing as for Gold or Silver; dry out and heat the piece; moisten the parts to be united with Muriate Zinc; use Blow-Pipe or Soldering-Iron. [Solder with the same Metal.] The Metal melts at 440° Fahrenheit."

We have been using this metal for the past six months, or more, with much satisfaction. It is undoubtedly one of the best substitutes for rubber of which we have any knowledge. It is tasteless—does not discolor, or at least, has not in any of the cases which have come under our observation; is more lasting than rubber, and a plate properly constructed of this metal will be found to fit the mouth as nicely as a rubber plate can be made to. Many have and will still fail in using it satisfactorily, from want of proper care in its manipulation. The case comes from the flask with the gums cracked, the rivets are imperfectly covered and the surface of the plate is full of pits or holes.

These are some of the results of careless and defective manipulation. If the foregoing instructions are closely observed and followed, paying strict attention to the italicised portions, a satisfactory result will be obtained, we think, in most cases.

In reference to Aluminium, which, the editor quoted above says, "can only be used as Weston's Metal is, combined with an alloy of tin and silver to connect the teeth to the plate," we would say, that it is now being cast without the use of tin or

silver, by a method substantially the same as used in casting Weston's metal. See "Method of Casting Aluminium Plates," in the last No. of the "JOURNAL." E.

SOUTHERN DENTAL CONVENTION.

By W. N. M.

The Convention of the Southern Dental Association commenced its second annual meeting on Wednesday, April 13, at 10 A. M., in the hall of the Mechanics' Institute, Dr. J. G. McAwley, 1st Vice President, in the Chair.

Dr. J. A. Thurber, President of the New Orleans Dental Society, read the welcome address, which was beautifully expressive of the sentiments of the profession in this city to the members of the convention, and was received with marked approbation.

On a call of the roll, by Dr. J. G. Angell, Recording Secretary, the following named gentlemen, active members of the Association, answered to their names:

Drs. W. H. Morgan, Nashville, Tenn.; J. R. Walker, New Orleans; Hy. A. Lawrence, New Orleans; J. G. Angell, New Orleans; G. J. Freidrichs, New Orleans; W. S. Chandler, New Orleans; J. S. Knapp, New Orleans; W. G. Redmond, Louisville, Ky.

The Committee on Membership reported, recommending the following gentlemen for active membership, and they were accordingly elected:

Drs. A. F. McLain, R. M. Lawrance, C. E. Kells, C. L. Thurber, H. Pierson, James West, S. A. Thurber, B. F. Smith, J. A. Casadavant, C. N. Sabourin, Hy. Lawrance, F. Anfroux, J. R. Walker, all of New Orleans; W. Johnson, Savannah; E. H. Hurmon, Nashville; R. M. Gage, and W. Denson, Mobile; E. Floyd, Fayetteville, N. C.; S. P. Cutler, Holly Springs, Miss.; T. L. Ulmer, Pleasant Hill, Ala.; J. B. Murphy, Atlanta; W.

N. Morrison, St. Louis; L. E. Edmonson, Galveston; J. B. Patrick, Charleston; E. R. E. Carpenter, Chicago.

Communications from different members of the Association who were unable to attend, were read, and after some other business of minor interest, the Convention adjourned until 8 o'clock P. M.

Evening Session. — Dr. McAwley in the Chair.

The following gentlemen were duly elected permanent members:

T. J. Freidrichs, C. W. Robinson, F. H. Knapp, J. A. DeHart, J. S. Cobb, J. M. Magee, W. N. Morrison, E. R. E. Carpenter.

The Committee on Dental Education, Dr. Gorgus, chairman, had no report prepared.

Dr. F. Y. Clark read an interesting paper on the subject of appointing dentists in the Army and Navy. The report was received, and approbatory remarks made by Drs. Morgan, Freidrichs, Walker, Magee, Cutler and Casadavant.

Dr. Ford offered a resolution that the President appoint two delegates to confer with and request the American Dental Association to appoint three members to memorialize Congress on the subject.

On motion of Dr. McLain, the Convention adjourned until 10 o'clock, A. M. Thursday.

Thursday, April 14. — The Convention met pursuant to adjournment; Dr. McAwley in the Chair. Minutes of the previous day were approved.

Drs. G. H. Kirk, of Tuscaloosa, Ala.; T. H. Harrison, Morton, Miss.; were upon ballot elected members.

Dr. Clark read an instructive paper on operative dentistry, and Dr. Morgan one on capping exposed pulps, and on heavy foils.

Dr. Cutler made some remarks on histological conditions and secretions of pus at the root of teeth, and spoke at length and with great interest on microscopical researches.

Dr. Morrison was appointed Corresponding Secretary, and Dr. Thurber, Assistant Secretary.

Dr. Cobb spoke next of the peculiarities of diseased molars, instancing a case of failure, resulting in pyæmic fever in a patient who was but twelve years old. Dr. Cutler expressed the opinion that it was caused by the funnel-shaped opening at the foramen being imperfectly filled. Interesting remarks were also made on the subject by Drs. Magee, Clark, Walker, and Ford.

Dr. McLain thought these ulcerations were induced by arsenious acid, devitalizing the pulp, and that this acid was absorbed to a much greater extent than was supposed.

After other remarks by gentlemen, on a variety of subjects of minor interest, the Convention adjourned till 8 o'clock, P. M.

Evening Session. — The President in the Chair.

Charleston, S. C., was selected as the place of the next annual assembly, on the 2d Wednesday of April, 1871.

The Convention adjourned till 10 A. M., Friday.

Previous to the daily sittings of the Convention, we noticed interesting dental operations by Drs. Clark, Carpenter, Shadoan, of Louisville, and others of the Association.

Friday, April 15. — The Convention met pursuant to adjournment, Dr. Morgan acting President.

Dr. J. S. Knapp read an interesting paper on the subject of wasted alveolar processes and gums, their treatment, etc., by Dr. W. H. Atkinson, of New York.

The merits of the paper were discussed at length by Drs. Taft, G. J. Freidrichs, J. R. Walker and others.

Dr. Herman, of Nashville, mentioned a difficult case of alveolar abscess, in which he had used the usual remedies unsuccessfully.

Dr. J. S. Knapp, advised the use of creosote in alternation with chloride of zinc.

Dr. Clarke, of Savannah, recommended carbolic acid, iodine and glycerine.

Meeting adjourned at half-past two, P. M., to attend the dinner given by the New Orleans Dentists, to the members of the

Association, at the Washington Hotel, Lake Pontchartrain. Representatives of the press, and quite a number of ladies were present.

The tables were handsomely decorated with flowers and each guest was presented with a bouquet. Wines of the finest brands in abundance. Strawberries, bananas and other native and tropical fruits were especially enjoyed by the assembled company.

The affair passed off most entertainingly. A number of toasts were given, to which appropriate responses were made by Dr. F. H. Knapp, and Dr. J. A. Thurber, who respectively occupied the ends of the table. Drs. Taft, Casadavant, Walker, Morgan, and others of the profession, were called out and made very pleasant little speeches. Also, representatives from the medical profession and the press, responded to their calls.

One of the most pleasant features of the occasion was the presentation of a elegant gold-headed cane, by the Association, as a mark of esteem, to Mr. Samuel Hape, of Atlanta, Ga.—Dr. Morgan making the presentation speech.

Evening Session. — On re-assembling, at eight o'clock, as per adjournment, the members all felt in such a good humor that Dr. Patrick called for Dr. Cutler to sing, "Shoo Fly," with the Association to join in the chorus.

Dr. Angel introduced a resolution that the Association take into consideration the importance of establishing a Dental Journal, South; which was adopted.

Dr. Angel, being called upon, then expressed his views, as chairman of a committee from the New Orleans Dental Association, of the importance of having an independent journal established.

Dr. Morrison of the "Missouri Dental Journal," and Dr. Taft of the "Dental Register," being called upon, gave their views upon the subject. They fully concurred in the opinion that there was room for another journal. Other members entertained the same views, and a committee of five, consisting of Drs. J. S. Knapp, (La.;) A. C. Ford, (Ga.;) J. B. Patrick, (S. C.;) W. H. Shadoan, (Ky.;) and R. M. Gage, (of Ala.) was appointed

to take it into consideration and report at the 10 A. M. session on to-morrow.

Dr. Cobb asked if it was possible for bad teeth in any way to produce cancer.

He was answered negatively by Drs. Clarke, F. H. Knapp, J. R. Walker, McLain and Magee.

Dr. Cutler was of the opinion that they might do so.

Dr. B. F. Smith read an excellent essay on the "Past and Present of Dentistry."

On motion of Dr. Walker, the meeting adjourned until 10 A. M. to-morrow, when the subject of Mechanical Dentistry was to be taken up.

The clinic operations this morning were of a very interesting nature. Dr. J. N. Knapp, operating in the mouth of Dr. McAwley, the President of the Association, made, in the handsomest and most skillful manner, a compound filling, with cylinders. The operation, and the manufacture of the cylinders by Dr. Knapp, were watched with great interest by the assembled members of the profession.

Dr. Shadoan, of Louisville, also made a handsome front filling for Dr. Clark, of Savannah.

Saturday Morning. — Association called to order by Dr. McAwley.

On motion of Dr. Cutler, reading of the minutes was dispensed with, and the subject of Mechanical Dentistry was called by Dr. Walker, who thought rubber work had been a curse to the profession.

Dr. Taft thought mechanical dentistry should be separated from the operative entirely.

Dr. Cutler wanted a higher style of mechanical dentistry under the direction of the operative dentist. After remarks from others the subject was closed, and miscellaneous business taken up. It was ordered that three hundred copies of the Constitution, By-laws, and Proceedings of the Association be printed, and one hundred be bound for immediate distribution.

At twelve o'clock the election of officers for the ensuing year resulted as follows:

President—Dr. James S. Knapp; 1st Vice President—Dr. F. Y. Clark; 2d Vice President—Dr. E. A. Herman; 3d Vice President—Dr. L. E. Edmonson; Corresponding Secretary—Dr. W. N. Morrison; Recording Secretary—Dr. John G. Angell; Treasurer—Dr. W. G. Redmond; Executive Committee—Drs. J. B. Patrick; G. Taff; A. M. Ford; W. S. Chandler, and Samuel Rambo.

The following named gentlemen were also elected Delegates to the American Dental Association, which meets in Nashville on the first Tuesday in August: R. N. Lowrence; —— Holmes; J. R. Walker; A. F. McLain; J. B. Patrick; R. M. Gage; E. Floyd; W. H. Burr; S. G. Holland; H. A. Lawrence; F. Anfoux; —— Auxspath; B. F. Smith; J. B. Murphy; L. E. Edmonson.

After a vote of thanks to the members of the press, hotels, railroads, steamers, and retiring officers,

Adjourned to meet in Charleston, S. C., on the second Monday in April, 1871.

ONE OF MY FAILURES.

By F. A. Brewer.

Not really relishing the test of self experimentation as occurring by a late attack of ophthalmic affection of both of my eyes, a "gentle reminder" to others, if timely, may prove beneficial.

On or about the 10th day of the present month (February) I had occasion to fill two cavities in the teeth of a patient suffering with chronic ophthalmia, and while so engaged and without forethought (forgive my disregard of ethics and self) carried my hand, or even my finger, to my eye, or eyes. On the evening following, symptoms indicated that my "visionary powers," as well as his, were disturbed, though so far at least very greatly modified. The correctness of which was amply testified

by an increase of soreness for some eight or ten days following, since which, by the employment of antiphlogistic remedies, etc., a speedy recovery seems now probable.

Cause.—My opinion favors the belief that a drop, or even more, of the secretion from the eye had reached my finger while about the mouth, and was thence conveyed to my own eye, or eyes. This view may be merely hypothetical; even prove illusory. However it has dumped into my brains one *sensible morale.*

He who regardeth the fact, that "self-preservation is the first law of human nature," should keep his fingers from his own eyes; yea, furthermore, out of his own nose, too, while handling such special cases. More anon.

Chillicothe, February 29, 1870.

THYMOL, A NEW DISINFECTANT.

This substance, properly called thymic acid, is recommended as a new disinfectant, in many respects preferable to carbolic acid. From several observations communicated by A. Paquet, it appears that in the undiluted state it is a powerful escharotic, useful especially to remove warts and cauterize hollow teeth, in which cases it acts without producing pain, and gives to the breath a far more agreeable odor than carbolic acid. An aqueous solution of it (1:1000) acts upon healthy ulcers without irritation, rather like a cooling application and antiputrid dressing, and puts them into a healthy condition. The same is the case with putrid ulcers in the cavities of the body, and by injecting into natural specimens a mixture of four parts of thymol, two parts of aniline, and four parts of tannic acid in 100 parts of glycerine, they may be made to keep for a month of a normal volume and color.

This stearopten of the oil of thymus vulgaris, though somewhat scarce and expensive, may in many cases be used as a substitute for the never odorless carbolic acid, and in much more dilute solutions.

From the Pacific Medical Journal.

MENDACIOUS QUACKS AND RESPECTABLE INDORSERS.

There entered our office recently a man of gentlemanly mien and deportment, feeble and emaciated in the extreme, and plainly in the grasp of death. After a few minutes' rest he told his errand as follows, unable to speak above a whisper: "I am from Calaveras County. I have been sick a long time; supposed to have consumption. My money was all spent, but I had kind friends who raised some money and sent me to the city to consult Dr. ——. They had read of his wonderful cures, and the certificates of Mr. —— and others. I went to see the Doctor, who required me to pay twenty dollars before he would hear a word. I paid him and then told my story. He said he believed that he could cure me, but would want three hundred dollars before commencing the treatment, and when I should find myself improving, two hundred more. *He made no examination whatever.* I saw at once that he was an impostor, and left him. Now, I have just enough money left to carry me back. I want you to examine me and give me a candid opinion. My friends will assist me when I return, so that I can send you your fee. But I cannot pay you now. I have no hope of getting well; I feel that I may not be able even to get back home. But I want a professional opinion in my case."

Repelling the idea of compensation under such circumstances, we proceeded to examine the chest, and in an instant detected an immense cavity occupying the upper portion of the left side. The left lung was entirely destroyed for the purposes of respiration, and only a small portion of the right lung remained to sustain life. The condition was so palpable that a first-course student would have been stupid not to discern it. No one other than a heartless and mendacious villain would have held out hopes of cure to this poor man and taken his money. The wretch who robbed him ought to be in the State Prison. But what shall we say of those *respectable* citizens who indorse such impostors and provide them with victims?—members of distin-

guished law firms, and Superintendents of Schools and State officials, who bait the dead-falls with their certificates of cure? Does not every intelligent person know that the presumption of knavery always holds against these itinerant "doctors?"—that the very fact of their migrating from place to place proves their claim to success and celebrity to be a lie?—that advertisements of capacity and skill are *prima facie* evidence of incompetence and imposture? Have they so soon forgotten Von Eisenberg—that model of advertising quacks—the most pretentious and magnificent charlatan that ever spread his toils in San Francisco? If testimonials of skill and certificates of cure signify anything, that personage was the greatest healer since the days of the Apostles. In the midst of a glorious career, the fickle element of popular favor all at once pronounced him a robber and a murderer, and he vanished before the next sunrise, and his name vanished with him. We expect ere long to write another similar biography.

MISSOURI STATE AND COLLEGE ASSOCIATION.

We would call the attention of our readers, especially those residing in Missouri, and States adjacent, to the notice of the meeting of the "Missouri State and College Association," to be held in this City on Tuesday, the 7th of June next, and it will be observed that the committee have prepared an excellent bill of fare, and from an intimate acquaintance with them we feel satisfied that it will be served up in the latest and most approved style. Since the last annual meeting there have been several important advances made, both in the surgical and mechanical departments of our science; among which may be mentioned the introduction of heavy foils, and the working of aluminium. These improvements will be fully demonstrated and discussed at this meeting, by those who have been in the constant use of them since their introduction.

Prof. Taft, of the "Register," who recently enjoyed the priv-

ilege of seeing the use of heavy foils demonstrated by one of our best St. Louis operators, very justly says: "It is well worth a trip of a thousand miles to any one to see it demonstrated." An opportunity is here presented the profession of Missouri and States adjacent to become familiar with this late novelty, which should not be allowed to pass unimproved. Come up from labor to refreshment, and bring a brother with you. Come, and we feel sure you will go away refreshed in body and improved in practice. E.

MISSOURI STATE AND COLLEGE DENTAL ASSOCIATION.

The Sixth Annual Meeting of the Missouri State and College Dental Association will be held at St. Louis, on the first Tuesday (7th) of June, 1870, at 10 o'clock A. M.

The following subjects will be presented for discussion: Dental Ethics; Heavy Foils; Filling Teeth with Gold; Oxychloride of Zinc as a Filling; Aluminum Plates; Irregularities of the Teeth; Miscellaneous Topics.

The Annual Meeting of the Incorporators of the Missouri Dental College, for the election of members to fill vacancies occurring in the Board of Trustees, will be held on Wednesday, June 8th, at 4 o'clock P. M.

The session of 1870 promises to be one of more than usual interest and importance. During the past year many valuable improvements have been brought out.

The discussion upon "Heavy Foils" can not fail to profit every one. Let us have a larger attendance than on any previous year.

J. B. MORRISON,
E. PARK,
G. A. BOWMAN,
} *Executive Committee.*

CHICAGO DENTAL ASSOCIATION.

CHICAGO, April 20, 1870,

Editors "Missouri Dental Journal," St. Louis:

Sirs:—At the Annual meeting of the Chicago Dental Society, held at the Dental Depot of S. S. White, Monday evening, April 4th, the following members were elected officers for the ensuing year:

President—George H. Cushing, D. D. S.; 1st Vice President—Dr. A. Brown; 2d Vice President—Dr. M. W. Sherwood; Recording and Corresponding Secretary—Dr. Edgar D. Swain; Treasurer—Dr. Wm. Albaugh; Librarian—Dr. J. S. Marsh; Executive Committee—Drs. J. N. Crouse, M. S. Dean, and Chas. E. Koch.

E. D. SWAIN, Sec'y.

CHICAGO MICROSCOPICAL SOCIETY.

We extract the following items from the retiring address of Dr. W. W. Alport, President of the Society for the last two years. The number of active members at the present time is 89, of which 67 have been added in the last year. Ten papers upon various subjects have been read before the Society. Ninety-eight microscopic specimens have been donated to it, together with several other donations, including one microscope, and other objects of interest. The Treasurer's report shows the sum of $881.50 on hand, and altogether the Society seems to be in a very flourishing condition.

J.

CHLORAL is most conveniently exhibited in the form of a mixture containing not over 40 grains to the fluid ounce, simple syrup flavored with peppermint being, perhaps, the best vehicle.

The Missouri Dental Journal.

A MONTHLY RECORD OF THE SCIENCE.

VOL. II.] JUNE, 1870. [No. 6.

(*From the Monthly Microscopical Journal.*)

PROGRESS OF MICROSCOPICAL SCIENCE.

NATURE AND ORIGIN OF BLOOD-GLOBULES.

MM. A. Béchamp and A. Estor have recently brought before the French Academy a paper on this subject, which will be found in 'Comptes Rendus,' 7th Feb., 1870. They remark that the blood-globules of man and the mammalia are usually regarded as small elastic masses, in which there is neither nucleus nor membrane. Deceived, they say, by their appearance under the microscope, these globules are taken for simple homogeneous masses, and they offer what they consider a demonstration that they are really masses of molecular granulations, agglutinated micro-ferments (*microzymas*). They state that when blood is received directly from the vessel which supplies it, in a glass containing alcohol (45°), it remains quite limpid, neither depositing fibrine nor globules. Soon, however, the transparency of the fluid is diminished, and an abundant deposit is found at the bottom of the vessel, which the microscope shows to be composed almost exclusively of molecular granulations free and mobile, or agglutinated. We can, they say, cultivate these granulations and promote their rapid proliferation. To do this the first mixture is thrown on a filter, the precipitate is retained, but some micro-ferments always pass, which are so prolific that at a temperature of 25° to 35° (C.) after a couple of hours another de-

posit takes place, and after thirty-six hours it is as abundant as the first. The same series of phenomena are repeated till the liquid has completely lost its color, and materials of nutrition are no longer supplied. The experiment may be made with blood that has been beaten up and defibrinized: so it is not the fibrine which furnishes the micro-ferments; they come from the globules, in which they may be found by simple methods.

The globules may be retained on the filter after a preliminary action upon them of solution of sulphate of soda. They are then placed on a glass slab and ground with a glass muller. By these means the globules are torn, and the micro-ferments, set free, swim in the liquid, with their proper oscillatory motion.

This experiment may be varied by taking a drop of defibrinized blood, and placing it under the microscope, when a mass of globules will be seen, in which it is difficult or impossible to find a single micro-ferment. Let a drop of distilled water be placed so as to pass under the glass cover of the object, and as it penetrates, the globules grow pale, and then become granular, soon breaking up and leaving in their place masses of very mobile micro-ferments, without a trace of pre-existing membrane.

The micro-ferments of blood behave like those of the liver in this method of evolution, and like those of fibrine. For at first they can, under certain circumstances, attach themselves together in chaplets more or less long. Placed in vials containing diluted starch creosoted, with or without addition of pure carbonate of lime, they rapidly develop into bacteria and bacterides.

These micro-ferments of blood-globules behave like ferments first under the form of microzymas, then in chaplets, and bacteria during, or after, this evolution. The starch of flour is rapidly liquefied by them; the mixture soon presents the characters of soluble starch and dextrine. If pure carbonate of lime is added previously to the starch liquid, and it is filtered, after a prolonged reaction the mixture lets fall a precipitate occasioned by the oxalic acid formed under the action of the ferments, which sometimes remain in the microzymic condition all the while, showing that this evolution into chaplets and bacteria is not necessary to their action upon the starch. The starch mixture

is always rendered fluid before the appearance of the bacteria.

The writers affirm that the micro-ferments still contained in the cells are in a condition for reproduction. They say they have often seen the birth of a great number of small cells, pale, slightly segmented (framboisées), and much resembling leucocytes, but usually smaller and more transparent. They have sometimes found from twelve to fifteen in the field of Nachet's No. 7, at one time, in liquid which some days before did not show a single one; and these cellules have never exhibited the characters of organs in proliferation, such as scission or budding. On the contrary, they have often seen very pale cells scarcely indicated by the micro-ferments agglommerated in spheres and motionless, and others more sharply defined, and further on true leucocytes.

From the preceding facts the writers conclude that the blood-globules are aggregates of micro-ferments (mycrozymas): that these mycrozymas can develop into chaplets of beads, into bacteria, or bacterides, &c.; that they behave like ferments; that the mycrozymas of blood-globules give birth to cells like leucocytes, and to other smaller cells, more resembling the globules. These mycrozymas are thus capable, in various media, of engendering cells. and so lead us to believe that the globule of blood, as an organism, is the result of the work of these mere micro-ferments.

Amongst other things which they conclude — somewhat hastily — is, that respiration belongs to the class of phenomena termed fermentation.

LEPTOTHRIX AND VIBRIO BACILLUS.

MM. Giuseppe Balsamo Crivelli and Leopold Maggi have an important paper in the "Rendiconti del Reale Instituto Lombardo," ser. ii., vol. i., p. 11, on the above organisms. They affirm that the leptothrix, the vibrio mentioned above, and several others, are developments from granules of the vitelline membrane of an egg, or from epithelial cells of the tongue, and that for their appearance no spores are required, nor germs floating

in the air, but only the transformation of a morphological element.

THE GROWTH OF ORGANISMS IN CONTACT WITH PHENIC ACID.

The preceding authors detail several instances of vibrions and bacteria appearing in animal solutions containing phenic acid; but they state that the acid kills them when their organization is complete.

(*From the Lancet.*)

THE ORIGIN OF THE WHITE CORPUSCLES.

The question of the origin of the white corpuscles of the blood is one to which it is by no means easy to give a satisfactory reply. That they are found in large numbers in the lymphatic glands as well as in the so-called ductless glands represented by the spleen and thyroid glands, is undeniable; that they are taken up by the blood as it circulates through these glands, is rendered almost certain, not only from a consideration of the anatomical structure which has been so beautifully elucidated by the researches of Goodsir, Frey, His, Teichmann, and a host of others, but from the results of comparative microscopical research applied to the afferent and efferent blood respectively. It even seems probable that the connective tissue of the whole body is to a certain extent subservient to the production of these corpuscles—if, indeed, it be true that the fluid of the lymphatics contains corpuscles before it has traversed any lymphatic gland whatsoever. It has long been admitted that the liver is a centre for their formation; and more recently the same function has been claimed for the muscles. Still no attempt has been made to determine whether they proceed from pre-existing organisms of a similar nature, or whether they are generated *de novo* in the lymph. A communication, however, has lately been made by Dr. Klien, to Virchow's "Archiv," which goes far to

show that they result from the fission of pre-existing corpuscles. On this Dr. Klein remarks that, in the blood of the water-newt or triton, three forms of white corpuscles can be distinguished, though not well defined from each other. The first of these are the well known granular or granulation cells; the second are large, pale, very finely granular corpuscles; and the third are characterized by their very small size. He has observed three modes of division to occur. In the first, which is frequently visible in the granular cells, the cells assume an hour-glass form, performing at the same time very active movements; and the two halves either separate entirely, or again fuse into one. In the newly formed cells a nucleus was sometimes perceptible. In the second mode the white corpuscle forms a thin transparent disc, from the periphery of which a projection is given off, which contains a distinct nucleus; the projection enlarges, and becomes gradually detached, whilst the disc again assumes its globular form, and creeps away. The third mode resembles that already described by Professor Stricker in the case of the migrating corpuscles of the tongue or cornea of the frog, and consists simply in the pinching off of a minute particle of the protoplasm, which then takes on separate growth, and becomes a new corpuscle. Dr. Klein states that, in the corpuscles of the blood of the triton at least, division may occur more than once in the same cell, whilst the process may be accomplished in either of the preceding modes. He has noticed similar phenomena in the blood of the frog. In man, however, even at a temperature of 100° F., division by the pinching-off process is rare. We need scarcely remark how important these observations are in reference to the rapid multiplication of cells in abscesses, and in various pathological formations; and how they supply a deficiency in our knowledge of these subjects which has long been felt.

RELATIVE VALUE OF HEAVY AND LIGHT MALLETS IN FILLING TEETH.

Read before the Chicago Dental Society, by M. S. Dean.

Mr. President and Gentlemen of the Chicago Dental Society:—In discussing the relative efficiency of the light and heavy mallet, philosophically, by those who are not assisted, somewhat, by an experimental knowledge of both, they are almost certain to treat the tooth and filling, as matter possessed of a considerable amount of inertia. I shall, therefore, at the outset, say a word in regard to this principle, although I do not consider it as having a very intimate bearing upon the subject.

That *passive* property in matter which requires, when at rest, force to put it in motion, and which cannot change from motion to rest without the agency of some force, is called *inertia*. The inertia of a body is in proportion to the quantity of matter which it contains. The less the quantity of matter in a body, (which is free to move,) the less will be the momentum required to overcome its inertia.

The weight of an ordinary molar tooth is about two scruples; so that the inertia of a tooth which is being filled, when compared with the force required to condense the gold, is so slight as to be practically inappreciable. It would be almost impossible to condense a pellet in a tooth suspended by a thread ; and it certainly could not be accomplished without overcoming its inertia—without moving it—even if the velocity of the blow be ever so great, and the mallet of the most elastic materials. Yet, it is an easy matter to drive the handle into a hammer when suspended in like manner, for in this case the inertia is much greater compared with the requisite force to be applied. If, however, the hammer be firmly held in the jaws of a vice while the helve is being driven into it, the hammer would receive the whole force given to the handle, and the vice would receive the same as the hammer—if "action and reaction are equal." So also the blow that is struck against the plugger gives its force to the pellet of gold, and the pellet gives its force to the tooth, and the tooth, in

turn, gives its force to the jaws, &c. Whether the matter be light or heavy, elastic or non-elastic, whether velocity be high or low, the force—momentum—in either case is not lost upon the filling nor upon the tooth itself, but is communicated without diminution to the contiguous surrounding parts; so that the inertia of the tooth and gold cannot be taken into account in either case, they being practically *the part of a whole.*

In the foregoing, we have considered *Force* merely as momentum—the quantity of motion which has been given to the mallet. Now let us, for a moment, consider force in reference to the measure of its power to overcome resistance, or, the amount of work performed before a moving body is brought to rest, which is expressed by the term *vis viva*, or living force. This vis viva is equal to the mass multiplied by the square of its velocity; whereas the momentum of a body is equal to the mass multiplied by its velocity. The light mallet having the same momentum, will of course have a greater amount of vis viva or power to overcome resistance than the heavier one.

For example:—Take a mallet weighing 4 ounces having a velocity of 4 feet per second; its momentum will be 16 and its vis viva will be 64. A mallet weighing 1 ounce moving at a rate of 8 feet per second will have a momentum of 8 while its vis viva will be 64. Here the heavier mallet has double the momentum of the lighter, yet its vis viva is the same.

Thus:—

$4\times4\times4=64$ vis viva. $4\times4=16$, momentum.
$1\times8\times8=64$ vis viva. $1\times8=8$, momentum.

Now, admitting for the present, these blows to be equally effective in packing the gold, it might by some be considered a weighty argument in favor of the light mallet. It certainly would be if *Saving of Force* was the main object sought. But this is not the case; force is abundant. The assistant can wield the heavy mallet even more easily than he can the light one, requiring more skill and accuracy; so the power *wasted* is of no consequence whatever, the saving of pain being the chief object in view. Then, which of the two mallets will accomplish the work the most effectively, and at the same time produce the least

pain, is the important question to be solved regardless of the amount of force expended.

That a blow from the heavy mallet will have a greater amount of vis viva than that of a lighter one having the same velocity will not be denied. And, that the teeth will sustain an almost indefinite amount of force, without injury, provided it be *slow* force, is a fact with which we are all familiar. That force applied *suddenly* to the tooth produces more pain than the same force—vis viva—when applied more gradually, is exemplified in our daily practice by the very apparent difference in the sensation resulting from a blow of the mallet (through the instrument,) upon an uncondensed pellet, and upon one after it has been consolidated. In the latter case the effect is more painful than in the former, for the force is more suddenly arrested, and consequently more quickly imparted, than when it is given to the comparatively soft pellet, where its velocity is gradually lessened from the point of impact until it is wholly arrested. In both cases the mallet is the same, and its velocity is the same, and the force imparted to the pellet, tooth and pericementum is equal and the same; yet its effect upon the sensitive parts is manifestly different, because, in the one case it has been imparted more *slowly* than in the other.

Again: You can wrench the teeth with the full force of the hand without causing pain. Many of you can crack a hickory nut between your teeth without inconvenience; but if an equal force were applied suddenly, as by a blow from a light mallet, the pain would be intolerable. I can flatten a leaden bullet between my teeth by closing them upon it several times, with no pain, but if this were accomplished by a like number of blows of a light mallet, the shock would cause insufferable pain.

From these examples we see that it is not so much the *quantity* of force used, which produces pain, as it is the *suddenness* with which the force is given. They also explain, I think, why a blow from a heavy mallet (though it have greater momentum,) having the same vis viva as a light one, is more tolerable to the patient; the *slower* force being more diffused, though it must be wholly given first to the "point of application."

From the foregoing we may reasonably conclude that the heavy mallet, having the same vis viva as the light one, will, when used in filling teeth, cause the least pain, it being the slower force.

In considering the painful effects of mallet force, we have had reference merely to the pain produced in the parts surrounding the tooth. But, in those teeth especially, which are held firmly in the sockets, we think the shock given to the pulp is much greater, and often much more painful, when the blow is from a light mallet than when the same vis viva is given by a heavier one. That the sharp quick stroke of a light mallet against the unyielding walls which enclose it, will bruise or shake this exceedingly delicate structure more severely than the slow, heavier blow from a leaden one, it seems to me will be obvious to every one. If this be so, we have another strong reason for using this mallet, at least more generally than the light one.

I have assumed, in the preceding, for the sake of argument, that the light mallet having the same vis viva, and less momentum, would be equally effective as the heavier one in packing the gold. This I have done, in the first place, although satisfied in my own mind that the heavy mallet, having the same vis viva, is the most effective, I am unable, I fear, to give any very convincing or satisfactory reason for my belief; and, in the second place, I think there is enough evidence in its favor without this. If the resistance was wholly or mainly at the "point of application," then the greater momentum of the heavy mallet would be (perhaps) of no account. But, in packing a pellet of gold, the resistance at this point is very slight, and increases until the force is wholly arrested. It seems to me in overcoming force of this nature, that of two blows having the same vis viva, (according to the formula laid down in the books) that having the greater momentum must be the more continuous force, for it not only has the same amount of vis viva to impart, but has a greater quantity of motion. In this respect it appears to more nearly resemble hand pressure.

In this attempt to defend the heavy mallet, I would not wage war against the light elastic or light inelastic one; for there are

occasional cases where the light one of high velocity is more effective in practice. For instance, where the attachments of the teeth are quite yielding, the alveolar processes absorbed, and sometimes, again, in the lower incisors, the light mallet is preferable. I would not, therefore, banish the light mallet from the operating room, but leave it, with my lighter foils, and use either or both when the case occurs indicating their use.

As to elasticity or inelasticity, I think these properties in a mallet not of sufficient consequence to demand the slightest attention here. It is true that in the perfectly elastic one there is no loss of vis viva, and in the imperfectly elastic one there is. In the lead mallet, there is more loss than in the ivory, rubber or steel; but as there is no benefit in economizing force, as before stated, the loss of vis viva, which is very slight, indeed is not worth retaining, as it is practically the same in its effect as velocity. That is, a mallet of perfectly elastic material would possess a little more vis viva in proportion to its momentum than the inelastic one. This quality, however, in my opinion would oftener be an objection to the mallet than an advantage, its effects being not only more painful but more liable to break the enamel.

Now, gentlemen, although the subject is by no means exhausted nor scientifically treated, I will leave it with you, believing that if there are any among you who are sceptical in regard to the merits of the heavy lead mallet, you may be converted, as I have been, by comparing its practical effects with others.

ALVEOLAR ABSCESS.

[Continued.]

The gums are a thickened and condensed portion of mucous membrane, which surrounds the neck of the teeth, and are continuous, on the one hand with the common mucous lining of the mouth, and on the other with the periosteum of the alveolar walls. It is made up, like the mucous membrane, of a fibrous connective tissue matrix, with veins, arteries and absorbents, and

in the fœtus has a whitish appearance and a density almost equal to cartilage, though there are none of the characteristics of cartilage to be found in its structure. Yellow elastic fibres are found quite abundantly in both gum and mucous membrane proper, but the nervous supply to the gums is far less abundant than to the thinner and less condensed portion of the mucous membrane. Although the gums closely embrace the necks of the teeth, there is no direct connection between the two. The mucous membrane is covered with papillæ, and over all is spread a pavement epitheleal covering of many thicknesses of cells. As we have to deal with inflammation in this affection, we will next proceed to a consideration of this pathological condition, without, for the present, taking any note of the various modifications which result from accidental circumstances or are brought about by varieties of surroundings. It is acknowledged upon all sides that some irritation precedes the inflammatory action, and the presence of irritation necessitates the existence of an irritant agent. But at this point we find ourselves upon the very verge of human knowledge, and all efforts to solve the questions as to how this agent acts, and whether it first acts upon the cellular elements of the tissues where the irritation takes place, or upon the vessels, the nerves, or the blood itself, have thus far failed.

We do not propose to discuss the various doctrines that have, from time to time, prevailed upon this subject, but prefer to confine ourselves to a consideration of all the facts that have been established that relate particularly to the inflammatory process. And this will next lead us to the microscopic appearances that present themselves in inflammation. If we examine the web of a frog's foot, or the wing of a bat, under the microscope, whilst they are in a normal condition, we shall observe very distinctly the blood corpuscles moving through the arterial ramifications, passing along the capillary net-work and entering the venous radicles on their way back to the heart. In the larger vessels we shall observe the red corpuscles passing rapidly along in the central portion of the stream, and we shall notice that in passing along the tortuous courses of the arterial or venous tubes, or even around the sharpest angles, their momentum never carries

them against the walls of the vessels, and one can hardly fail to come to the conclusion that there is a mutual repulsion between the vascular walls and the red corpuscles, which might account for their keeping so uniformly in the centre of the fluid contents of the vessels. The white corpuscles, on the other hand, are seen creeping slowly along upon the margins of the stream, rolling, as it were, upon the inner surfaces of the walls of the vessels; and if there seems to be mutual repulsion between the vascular wall and the red corpuscles, there seems to be a mutual attraction between the walls of the vessels and the leucocytes or white blood-cells, evidenced not only by the fact that the white corpuscles keep closely against the inner surface of the vessels, but also by their slow movements, the red cells rushing rapidly past them; and as they are both floating in the same fluid stream it is difficult to account for the great difference in their velocity on any other supposition than that the attraction which exists between the walls of the vessels and the white corpuscles retards the motions of the latter. If we now irritate the part under examination by the application of an irritant, we observe, first, a contraction of the small arteries and veins, which has been probably mistaken by many observers for a contraction of the capillaries themselves. We must bear in mind that the capillaries proper have only a single coat, and are not known to contain any contractile tissue, so that when Gross and other authors speak of the contraction of the coats of the capillaries, they must have meant the minute arterial ramifications, and the radicles of the veins. Cold may contract and heat expand their walls, doubtless in accordance with physical laws, as applied to all matter, and it is not improbable that their walls are endowed with the physical property of elasticity, but there is no evidence that they are endowed with the property of contractility. It has been stated by some observers that if the irritation be severe the vessels will be "instantly dilated, or that if contraction takes place it is so slight and transient as to be inappreciable to the sight;" in which case we must suppose that the irritability has been instantly destroyed, as in cases of severe shock to the nervous system. Authors are not agreed as

to the duration of this contracted state of the vessels, some stating that dilatation follows almost immediately, whilst others have observed the vessels of an irritated part contracted for hours before dilatation commenced. There is no doubt but the duration of the vascular contraction is influenced by many surrounding circumstances, but the main fact is well established that dilatation follows next in the train of morbid actions, and this is undoubtedly due to exhaustion of the muscular fibres of the middle coat of the vessels, or paralysis of the nervi vasorum, The congestions that follow the section of the great sympathetic nerves, demonstrate that dilatation of the vessels takes place when the nervous influence is removed, and it is well known that unusual and excessive muscular action soon exhausts the irritability of muscular fibre, which would lead to the same result. When dilatation of the vessels of a part first takes place there is an increased action of the blood, consequent upon the removal of an obstacle to the circulation, which had been brought about by the contracted vessels, but soon the flow of blood is retarded in the inflamed part, its movements become unsteady and oscillatory, and finally altogether stop, and we have a complete stasis or stagnation. If we consider its "vis a tergo" as the only cause of the circulation of the blood, we should be at a loss to account for this static state, but by recognizing the fact that other forces are brought into requisition that are as essential as the propulsive efforts of the heart itself, it may be much more easily explained upon philosophical principles. The red globules now seem to cling to one another and to the walls of the vessels, and where there seemed to be mutual repulsion before the inflammatory action was established, there now appears to be a mutual attraction, not only between the walls of the vessels and the red corpuscles but also between the red corpuscles themselves. The vessels in the immediate vicinity of the inflamed spot are dilated and contain more than a normal quantity of blood, and if the inflamed part is of any considerable size, the heart and arteries take on an increased action, and we have the general disturbance designated as inflammatory fever. After a cursory glance at some of the results of

inflammation, we shall be in a condition to direct our attention to the treatment of its different stages, and the modifications which result from surrounding circumstances.

Operative and Surgical Dentistry.

CHLORAL HYDRATE AS A REMEDY FOR SENSITIVE DENTOS.

By Roscoe C. Mowbray, M.D., D.D.S., Warsaw, Ill.

Two years since the attention of the profession was called—by a gentleman of large experience—to the sulphate of morphia as a remedy of great utility in obtunding the sensitiveness of dentine.

Morphia *does much* to relieve sensitiveness *when placed in cavities*; particularly when it is placed there *properly*. I have never seen a case that morphia would not relieve to some extent, when used persistently.

To obtain the best results, free access to the cavity must first be obtained. This can usually be accomplished without much discomfort to the patient by the use of small chisels, from a line to a half a line in width, and the mallet.

After carefully removing a portion of the diseased dentos, inject (by the aid of a small dental syringe) a strong solution of morphia into the cavity, taking care to have the injection the natural temperature of the teeth, (about 98° Fahrenheit).

From the tubularity of dentine, as well as the communication of the iritated contents of the dental tubuli, absorption is exceedingly rapid. Appreciating the condition, as soon as the patient spits, you are ready with well-formed, sharp excavators to remove more diseased dentos, which you do speedily. If the condition is not much improved, inject it again, and repeat the application a dozen times if necessary.

Thoroughness in application is desirable, and perseverance is frequently essential to success. Teeth that this treatment does not relieve will invite your attention to other remedies.

A substance I have been using with great success is the new hypnotic, chloral hydrate. After suitably preparing a tooth, a strong solution of chloral may be injected; or, the chloral itself may be lightly compressed into every part of the cavity — which usually contains sufficient moisture to dissolve it; if it does not immediately soften, moisten it with a drop of water.

Thirty grains of chloral dissolved in forty of water, makes one fluid drachm of the saturated solution.*

When I use solid chloral I cover the orifice of the cavity with beeswax, and let the medicament remain for five minutes, when relief may be expected.

Thus far I have not used it in a single case without benefit. In many cases the relief is surprising; a complete absence of sensibility being effected.

It must be mentioned in regard to the use of this, as of all other dental medicines, thoroughness in their application is of the utmost importance, and often imperative to attain the desired result.

When a cavity approaches the pulp and is *very* sensitive, patients usually mention, "the tooth feels warm, but is not painful;" the effect is probably somewhat similar to that of chloroform, when placed in a carious tooth; but far more efficacious in cases of sensitive dentos.

The generally accepted view of the action of chloral, when given internally, is, that it is decomposed in the blood, and chloroform is set free; but its effect is different from the administration of chloroform by inhalation, being more prolonged in consequence of the slow evolution of chloroform.

This peculiarity of the hydrate places it in a position between narcotics and anesthetics. Its somniferous principle has readily classed it with the hypnotics. The dividing line between anesthetics and narcotics has hitherto been sufficiently clear, but

* Lancet. — Braithwaite.

this drug calls attention to a new position, in some degree like both, but distinct from each.

I would state in conclusion, thus far I have observed no ill effects upon the pulps of teeth treated in the manner described.

ON REPLACEMENT OF LUXATED TEETH.

By Charles A. P. Garnsey, Chicago, Ill.

Upon reading an article in the May No. of the "Missouri Dental Journal," on this subject, from the pen of a brother practitioner in Iowa City, I was induced to jot down a few ideas connected with a case or two which came under my own observation, which may be of interest to the numerous readers of your Journal.

I am aware that there is great opposition among members of our profession to this mode of practice. And I doubt, myself, the advisability or safety in *some* cases of replacement of luxated teeth; for instance where there is serious or complicated fracture of the alveolus or maxilla, by the operation of extraction; and certainly to insure anything like success in the operation there should be a favorable state of health, and a normal condition of the mouth, particularly of the teeth, gums, and mucous membrane.

With a case in this condition there would be less inflammation and soreness following the operation, and, also, the tooth or teeth should be replaced, certainly in most cases, within an hour after displacement, and *always*, if possible, *immediately*. I am of the opinion that at least a partial re-union of the parts involved takes place under a favorable general condition. The theory that a permanent re-union of the nerve takes place, as advocated by some, I am not prepared to accept. I am strongly in favor of this practice, under such favorable circumstances above mentioned. Also, the tooth or teeth should be placed in tepid

water and the socket thoroughly cleansed with the same before replacement.

Numerous successful and well attested cases,* have been brought to my notice, which confirms me to a great degree, in the success of this practice. Even should the case not do well for more than two or three years, Why not? And how do we know that they may not last and be of good service five times as long?

Some twelve years ago, when a student, two cases of extraction and replacement (sound teeth), came under my personal notice. I remember that the operation of replacement caused but little pain or trouble to the patients, soreness and inflammation disappearing in about two weeks; and in three years afterwards they were as useful as any other teeth, color was good, and gave no trouble, and for what I know they may be, and probably are, the same to this day. If my memory is not at fault, they were both bicuspids and different subjects. The teeth were not filled in the interval between extraction and replacement, although I certainly think this would be the best practice, i.e., to drill into the crown and from thence open into the nerve canal, removing the nerve and fill both crown and nerve canal before replacing, and it should be done in the quickest possible time, that it may not injure the periosteum dentium. I don't wish to be understood as advocating the practice of extracting carious teeth and filling them out of the mouth, and then reinstating them. That is *one way* of doing business; nor of curing alveolar abscess by

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* "Missouri Dental Journal," Volume One, No. 11, page 512.
Harris' Principles and Practice, page 414.
Taft's Operative Dentistry, Second Edition, page 405.
Robertson on Extracting Teeth, page 172.

Dental	Cosmos,	Volume	Second,	Number	V,	page	271.
"	"	"	Third,	"	V,	"	283.
"	"	"	Fourth,	"	V,	"	282.
"	"	"	Seventh,	"	XI,	"	583.
"	"	"	Eighth,	"	I,	"	31.
"	"	"	Ninth,	"	IV,	"	199.
"	"	"	Tenth,	"	VIII,	"	408.
"	"	"	Tenth,	"	XI,	"	587.
"	"	"	Tenth,	"	VII,	"	383 and 384
"	"	"	Tenth,	"	X,	"	531.
"	"	"	Eleventh,	"	X,	"	507.

extracting, scraping off the ulcer and replacing them in the alveolars, as of a recent reported case down east—*that is another way.*

The following is a case that occurred in my own practice not long since: About the first of last February, a married lady, about the age of twenty-five, called to have a root extracted belonging to the first right inferior molar; it having been left in after an attempt at extracting the tooth (as she said), some time before. On making an examination, I found that the second molar had, in working forward, nearly closed up the space between it and the second bicuspidatus, with the top of the former leaning toward the latter. I anticipated no trouble, and forthwith attempted its extraction with my (usual in such cases) inferior alveolar forceps. But with all my force in all directions, and in six different attempts, I failed to remove it, and although I could see the top move to and fro laterally, it baffled my repeated attempts, more than any case of extraction I ever met with. My diagnosis *now* was that it was either a case of exostosis, and a huge one, or that it was held between the two adjoining teeth by the unnatural shape of the root. She could not tell me how much of the tooth was formerly extracted, and as I was about tired of such fun, and she being "true blue" and determined upon having it out, I hit upon a plan, and with her consent, I put it into immediate execution. It was no less than to extract the second bicuspidatus, and after removing the root. (which I then expected to do) to replace the former.

After extracting the bicuspid and laying it in tepid water, I again "went for" the obstinate root and after considerable tugging of a forward and lateral nature, I brought to light to my surprise, the *two* large roots of the first molar, and strongly joined together a third of their length. Satisfied with having "mastered the situation" at last, I thoroughly syringed out the alveolar cavity and immediately placed therein the bicuspidatus, with little or no pain, in its exact former position, and after cautioning the patient about taking cold, and to masticate altogether on the opposite side, until the soreness had disappeared, with a prescribed astringent mouth wash, I then dismissed her with in-

structions to call and let me see the case in about two weeks, if it gave her no serious trouble in the mean time. She did not call again for a month, at that time the tooth was perfect in color, tight in its socket, and gave no trouble. She was very much pleased with the result, and promised to call and let me see it, if it ever troubled her. Not having seen her since, I conclude that "all is well." I don't wish to be understood as advocating the extraction of sound teeth and replacing them, only in case of accident, or in some other extreme case, &c., &c., as last mentioned.

MORE ANON.

HEAVY FOILS.

By GEO. H. CUSHING, Chicago.

A paper read before the Illinois State DentalSociety, at its last Annual Meeting, and published by permission of the Society.

MR. PRESIDENT AND GENTLEMEN:

The title of the paper assigned to me presents two entirely distinct subjects, which will of course be considered separately, and in the order in which they are named.

The subject of "heavy foils," presents for our consideration the most remarkable and complete revolution in ideas and practice which has ever occurred in the Dental profession; one which, had it been predicted three months before it occurred, would have been scouted as utterly visionary and impossible by many, if not all, who were so soon thereafter its first and most earnest advocates.

The tendency for many years past has been toward lower numbers, that is, to lighter foils; till No. 2, or that which contained but two grains to the sheet, was considered by many as the only foil which should be used by those desiring to secure the very best results. Now, when we come to the proposition, at once and with no intermediate steps, that No. 60, or foil weighing sixty grains to the sheet, is the best under most circumstances, and in fact the only style of foil which can produce first

class results, we can realize something of the magnitude of the revolution we are about to discuss.

But more astonishing things have been known in the past, and we need spend no time in wondering at this extraordinary step in advance, if such it should prove to be, but at once proceed to the endeavor to understand the philosophy of this claim in favor of heavy foils, and to try to show what practical experience has demonstrated regarding their use. It will probably appear, upon a careful consideration of the subject, that there are good philosophical grounds upon which to base the claims made for these foils, and the absurdity of the proposition to substitute Nos. 30, 60 and upwards, for Nos. 2 to 6, will under this process almost entirely disappear, while the facts which practical demonstration has established will confirm the theories.

In treating this subject it will be upon the assumption, of course, that the method of filling is by the use of adhesive foil exclusively. The requisites of a foil for this style of operating are, that it shall be as soft and pliant as possible, consistent with its great adhesiveness, and at the same time that it shall be tough and tenacious, not liable to disintegration afterwards. Perfectly pure gold, properly treated and rendered as thin as possible by rolling, probably possesses these qualities in the highest degree, while lamination, or beating out by the ordinary process, seems to deprive it, in a measure, of these properties, particularly after the lower numbers are reached. The best article which has, perhaps, been published touching the philosophy of this portion of the subject, is one from the pen of Professor Eames, of the Missouri Dental College, which appeared in the January number of the "Missouri Dental Journal," and to which I would refer you for a more full statement regarding this feature. It has doubtless been observed by many practitioners, that the lower numbers of foil, of all makers, did not possess the requisites of a first class adhesive foil, to the same extent as the higher numbers—I refer to Nos. as high as 8 to 10.

In conversation with Dr. W. H. Morgan, of Nashville, some two months ago, he stated that he had observed this peculiarity for a long time, and had been gradually using higher numbers.

in special cases up to Nos. 8 and 10, but at the time of this conversation, he had not become a heavy foil advocate, as that term is now understood, so that it would appear that the minds of some of the profession were turned in this direction long ago.

Who was the first to reason the matter out to its ultimate conclusions, I am not aware. So far as we are informed, Dr. W. H. Atkinson, of New York, first called the attention of the profession generally to the matter in this country, and Dr. H. J. McKellops, of St. Louis, was the first to introduce the practice in the West.

I am informed by Dr. Horace Enos, of Chicago, that Dr. Evans, of Paris, has been using foils as heavy as No. 120, since, perhaps, six years ago, and we may yet learn that others of the profession, in the old country, have also ante-dated us in the use of heavy foils. But it is immaterial who was the first, and as we have no account, so far as I am aware, of the reasoning on the subject, which brought the early advocates to arrive at their *highest* conclusions, we may endeavor to reason for ourselves upon this point. It is clear that if Nos. 8 and 10 were found, by experience, to be better than the lower numbers, in respect to adhesiveness, then higher numbers still might reasonably be supposed to possess, in a greater degree, this essential quality; and if it was found that Nos. 8 and 10 were applicable in cases where before it was deemed that they could not be successfully used, it was then equally reasonable to suppose that still thicker gold might be employed in such cases, also, advantageously.

These points could only be demonstrated by experiment, and so those first giving attention to this subject may be supposed, under the impulse of the above reasoning, to have tried experimentally heavier and still heavier foils, till the utmost limits were reached, and to-day we have some of the best men in the profession, advocating the use of foils of numbers ranging from 60 to 120, and in some especial cases as high as 240.

Now, all that can be said in favor of this radical change in practice, would fail probably to convince the sceptical minds of the profession immediately. It is hardly to be expected that all the teachings of the advanced men of our profession, for these

many years past, are at once to be set aside as all incorrect, and a new theory, so widely at variance with the old, to be accepted upon the mere affirmation of its advocates. We are, most of us, like unbelieving Thomas, and can only be convinced by tangible proof and ocular demonstration.

Still I will endeavor to state briefly, the grounds which I conceive to be philosophical, in support of the claims which are advanced for heavy foils, and also, what experience seems to have established regarding their practical use.

To reconcile the claims of this great revolution in practice with the principles of philosophy, will be to make clear to our minds, the proposition that foil of the thickness of No. 60, is better than No. 2, for the purposes of filling teeth, that it is equally manageable, is applicable in all cases where No. 2 was formerly considered to be almost the only thing that could be used, that it is more adhesive, welding more perfectly, with less force, and making a more solid filling. I think this can be established. In order to do this, we must go back to the examination of how No. 2, or other low numbers of foils are manipulated, and in doing this, I think we can easily explain away a fallacy which has prevailed regarding the use of low numbers of foil generally.

The lower numbers of adhesive foil are used by either rolling it into pellets of various sizes, into ribbons or ropes of varying diameters and lengths, or folded upon itself with more or less irregularity into strips or blocks. I think it may be safely stated that the foil as it is generally prepared for use, presents a mass folded upon itself more or less irregularly, varying from ten to twenty thicknesses of the original foil, according to the sized pellet, strip or block. Now, when we use this are we not practically using No. 20, 40 or 60? In fact, we are using a heavier foil than the number of folds represents, for it is so folded upon itself in such irregular shape that it presents an endless succession of surfaces and angles, traced in every conceivable direction one against the other, rendering the mass more resisting than a solid sheet would be, which represented the number of folds we have in our pellet.

Herein, I think, lies the fallacy which has prevented many from seeing anything reasonable in the claims made for the heavy foils, viz: in ignoring the fact that we have practically been using heavy foils, though composed of a succession of layers of lighter numbers; and I think it must be readily seen that if we can pack twenty layers of No. 2 or 3, satisfactorily, we can equally well pack a single layer of No. 40 or 60, in the same place, and it certainly is sound philosophy to say that it can be packed more easily and perfectly, for the reasons mentioned before, viz: that in folding the lighter numbers upon themselves, no matter how regularly, we have a largely increased resistance to overcome, and largely multiplied surfaces to weld together.

Now, as it is well known that the less gold is hammered or beaten, the more it retains of the properties of adhesiveness, softness, tenacity, and pliancy. I claim that philosophy clearly establishes that the thicker the gold, (within certain limits,) which can be used, the more perfect will be the welding, and the more solid will be the filling. Thus much for the philosophy sustaining these claims.

Now, to consider briefly, what experience teaches concerning the use of heavy foils:

1st. That as high as No. 60, they are applicable in all classes of cases where the mallet can be used, even in the most frail teeth, where the inexperienced in the use of these foils would think they surely could not be used, but experience seems to prove that they are peculiarly adapted for use against frail walls, accommodating themselves to their irregularities with great facility, and requiring but slight force to place them properly, and in fact giving immediate support to the frailest wall, and thereby rendering the operation less difficult and less dangerous.

2d. No. 60 fills retaining points better than any other number, making more certain and solid anchorages than the lighter foils.

3d. They are much more adhesive, and when properly packed must make a stronger as well as more solid filling, while owing to the peculiar softness, as well as great adhesiveness of the

numbers as high as 60 and upwards, they require really less force to condense them thoroughly, than the numbers from two to ten.

4th. In binding they are invaluable; that is, where the cavity is approximal and crown compounded, and the approximal portion can be but poorly anchored, as is sometimes necessarily the case, while a good anchorage can be secured in the crown—in such a case, by securing a strip of No. 60 or 120, in the crown and carrying it over to the approximal portion, the filling can certainly be made more perfectly secure, than with the light foils.

5th. In building out and restoring the contour, they make vastly stronger operations than anything of the kind done with the lower numbers, could possibly make.

6th. They spread laterally, in condensing, to a much greater degree than the light foils; and, finally, to sum up in a word their merits, they produce, when properly packed, the most perfect operations which have yet been attained.

Now, it may be said and doubtless has been by many: "We must wait and see if these operations made with heavy foils fulfill the promise of their advocates, before we accept the new doctrine."

This is a very proper and natural caution, which we should all exercise, regarding new methods and practices, but I may remark that it is very curious to observe how quickly these doubts disappear from the minds of the most sceptical, when they have once given the matter a fair experimental trial.

I have three cases in my mind in which gentlemen experimented with the heavy foils, simply to prove their worthlessness. The foils were condemned in their minds beforehand, as utterly impracticable, and only tried by them at all, in order that they might be able to say, they had tried them, and the foils had proved just as they knew they would—worthless. All three of these gentlemen are now using the heaviest foils exclusively. Their first experiments opened their eyes to the fact that their prejudices were unjust, and further experience only more and more fully established the superiority of the heavy over the light foils.

From my own experience, and that of others of my acquaintance, it would seem that all such doubts vanish before the "inexorable logic" of practical experiment. We are convinced in spite of ourselves, and the perfection of the operation of these foils becomes so established as we use them more, that there is not left any ground for even the most careful to say, "we must wait for time to prove the value or otherwise of this new method." I say this seems to be the case, and yet, perhaps, it is now too early to say that time will not prove that our present convictions are erroneous. My own belief is, that time will prove conclusively the truth of the seeming advantages of the new method.

With reference to the method of manipulation, it is difficult to write satisfactorily; one observation of an operation would teach more than twenty pages of written instructions, and I will only briefly state some of what I consider the chief points to be closely observed. The foil should not be handled with the uncased fingers; it may be cut into pieces varying from one-fourth to three-fourths of an inch square, or into strips of proper width and length to suit the case. Where easy access is to be had to the cavity, the strips may be used to excellent advantage, condensing each layer across the whole surface, and folding the strip upon itself, thus saving time. The retaining points should be carefully filled, and the foil packed carefully from one retaining point to the other, securing and preserving as nearly uniform and plane a surface as possible, and the foil should be carefully condensed at and over the margins of the cavity, layer by layer. Care should be observed not to allow the foil to become very much crumpled or folded very irregularly upon itself. Rather small points should be used in packing it, as with them less force of malleting is required than with larger points, while in finishing the operation of packing, great care should be observed to condense the entire surface thoroughly.

It must not be supposed that operations are greatly facilitated by using the heavy foils. My own experience thus far, is, that it requires longer to perform thorough operations with the heavy than with the light foils; but that should not weigh against them when the greater superiority of the operations is considered.

I have thus far spoken chiefly with reference to No. 60 and higher, which I consider as most desirable in a majority of cases, though Nos. 20 and 30 may be used to advantage in large fillings, for the principal part of the operation, as those numbers, when the cavity is favorable, can be packed more rapidly than the higher, while the heavier numbers should be used for the margin and for finishing. I would, also, recommend these numbers to beginners, for their first experiments, from which they will soon feel their way to the higher grades.

Before concluding what I have to say upon the subject of heavy foils, I would remark, that since writing this paper, I have been using foil of Nos. 30, 60, 120 and 240, which were not hammered at all, but produced by rolling, and they are certainly softer and more manageable than any I have used, made by the ordinary process of beating, and I think more adhesive. They seem to me, forcibly to corroborate the statement made in the first part of this paper, that "perfectly pure gold, properly treated and made thin by rolling, possesses the essential properties of an adhesive foil in the highest degree." This foil also possesses the advantage of presenting a dull surface, an advantage which those who have used the heavier bright foils will not fail to appreciate. R. S. Williams, of New York, is the manufacturer of the foils I now speak of.

In conclusion, I would earnestly commend the heavy foils to all who desire to secure the highest results, feeling confident that if these foils are fairly and properly tried, they will commend themselves far beyond anything that I could say in their favor.

REPLACING LUXATED TEETH.

In the last number of the JOURNAL, E. C. C., at the close of his very interesting article on this subject, asks for testimony, pro or con, in regard to this operation.

About a year ago a young man, perhaps twenty years of age, called at my office to have the *first right inferior molar* extracted.

The tooth was very much decayed. The approximal cavities were so deep that an instrument would readily pass through the tooth. The patient was suffering *intense* pain and would consent to no conservative treatment. There was some inflammation in the adjoining soft parts, and decided symptoms of periostitis. The adjacent teeth (molar and bicuspid) had approximated so as to render the extraction of this tooth extremely difficult, and in fact it could not be done safely, without splitting, and leave things in *statu quo.* I applied the forceps, (taking care not to break the tooth or wound the gums,) and raised the tooth out of the socket until it was held firmly between the molar and bicuspid adjoining, and left it there, then thoroughly washed alveolar cavity with tepid water and a solution of phénol sodique (with syringe) and replaced the tooth.

Pain was instantly relieved and patient very much pleased. Gave solution for local application and prescribed third decimal preparation of mercury in two-grain doses for five hours. Saw patient often — no unpleasant symptoms — about three weeks later I removed the pulp and filled fangs with gold and crown with Walker's amalgam. The tooth is doing good service and bids fair to do so for years to come.

M. A. Spencer.

Orrville, O., June 2, 1870.

REPLACEMENT OF LUXATED TEETH.

Having read an article on the subject of replacing teeth removed by accident, in the May number of the Journal, by E. C. C., and an expression from others solicited, I desire to state that two years since, I extracted a right superior first bicuspid by mistake, and immediately replaced it. At the expiration of two or three weeks it was quite firm and entirely free from soreness, and still continues as healthy and useful as ever.

This is an isolated case in my experience, but from what I have read of the practice of others, I have no doubt of its success in ordinarily favorable cases, in nearly every instance. It

would seem that the contraction that would naturally occur in the severed parts would prevent the nerve from reuniting. I would like to be informed upon this point.

SENECA B. BROWN.

FORT WAYNE, Ind.

Mechanical and Miscellaneous Department.

LABOR SAVING MACHINES.

There is perhaps no step in the process of filling teeth more laborious and fatiguing to the operator, or more unpleasant to the patient than that of dressing off and finishing the plug.

To secure an instrument or some means by which the time and labor required to do this part of the work might be lessened, has long been a desideratum with the profession. We have recently seen two instruments designed to meet this want. The first, known as Green's Pneumatic Engine, has been in use in this and other cities, for several months. This instrument, although not altogether perfect, is a decided improvement upon the old hand burr, for dressing down fillings; the work is done with much less labor and in one-fourth of the time. By means of a separate attachment the engine is made to carry a file or polisher, also burrs, or drills, for preparing cavities in the distal surfaces of molars or bicuspids. None of these appliances are however of much value, for the want of power, in the engine, sufficient to run them with any force. The principal defects of this machine are want of power, is too noisy, and costs too much money. It has served a good purpose in demonstrating the fact that the labor of filling teeth may be greatly lessened, and the time now required to do the work shortened at least one-half, by the aid of the mechanical forces. It has set other inventive minds at work to improve and perfect the grand idea of supplying the profession with a universal labor saving machine, and the

result, as exhibited in the late invention of Dr. J. B. Morrison, of St. Louis, is certainly very flattering.

Dr. Morrison's instrument is entirely different in principle from the Pneumatic Engine, the motive power of which is as its name indicates, compressed air; while Dr. M's. is run by a simple treadle movement, as a foot-lathe. It is certainly a decided improvement upon the engine in many respects: 1st, it has unlimited power. 2d. It is almost noiseless. 3d. It is much more simple in construction, is therefore not so liable to get out of order, and can be sold at a price within the reach of all, or at least, at one-half the cost of the engine. 4th. It is lighter and smaller than the engine, and consequently more convenient. There are many other minor points in which it is superior, which will be at once recognized on comparison. It is capable of all the attachments proposed for the engine, with this advantage, that it has sufficient power to run any of them, with any amount of force. It is intended to aid in the preparation of all classes of cavities, condense the gold, dress off and polish the filling; also, to be used in cleansing and polishing the natural teeth, in fact its application is so universal in all operations upon the dental organs, that it may be very appropriately christened, "The Universal Dental Labor Saver." E.

"THE ARTS."

This is a new monthly publication devoted to "Science and the Arts," the second number of which has just made its appearance. The first two numbers have done much to impress us with the belief that it will prove to be one of the most valuable scientific publications in this country. The "Arts" is published upon the 15th of each month, by James M. Henche & Co., Nos. 10 and 12, South Wells street, Chicago, at the very low price of one dollar per year. J.

CONSTITUTION AND BY-LAWS FOR LOCAL DENTAL SOCIETIES.

We publish the following Constitution and By-Laws of the South Carolina State Dental Society, for the benefit of those who are forming new Associations or Societies. We have had frequent applications of late for copies of constitution and by-laws, and take this method of supplying all such with a copy which contains the *essentials* in a small space. J.

ARTICLE I—NAME AND OBJECT.

SECTION 1. This Society shall be known as the "SOUTH CAROLINA STATE DENTAL ASSOCIATION."

SEC. 2. Its object shall be to contribute to the elevation of the Dental Profession in South Carolina, by encouraging a free and liberal interchange of opinions on methods of practice, and the literary discussion of subjects relating to dentistry; to advance the standard of dental education; to promote the usefulness, honor and interest of its members, and to enlighten and direct public opinion in regard to the duties, responsibilities and requirements of the Dental Profession.

ARTICLE II —OFFICERS AND ELECTIONS.

SECTION 1. The officers of this Association shall be a President, a First and Second Vice-President, a Corresponding Secretary, a Recording Secretary and a Treasurer. They shall be chosen from among the members present at the meeting at which such election shall take place.

SEC. 2. Each officer shall be elected by ballot, and shall serve until the next anniversary meeting, or until another is elected to succeed him.

SEC. 3. The election shall take place at the anniversary meeting, and a majority of the votes cast shall be necessary to a choice.

ARTICLE III—DUTIES OF OFFICERS.

SECTION 1. The President shall open the anniversary meeting with an address, and perform all the duties that custom and Parliamentary usage shall require. He shall not be eligible two annual terms in succession.

SEC. 2. The Vice-Presidents shall, when called upon, assist the President; and, in case of his death or absence, preside, in their order, over the meeting.

SEC. 3. The Recording Secretary shall keep correct minutes of the proceedings of the Society, and a list of members, with their post offices. He shall perform such other duties as custom or the Association may require.

SEC. 4. The Corresponding Secretary shall have charge of and conduct the correspondence of the Association. He shall open communications with Dental, Medical and Scientific Societies, and with eminent Dentists, Physicians and Scientists in any part of the world, and report semi-annually to the Association.

SEC. 5. The Treasurer shall receive all moneys belonging to the Association from the Recording Secretary and disburse them as directed, preserving as vouchers, orders for every payment, signed by the President or Recording Secretary; and shall, at each anniversary meeting, give a full report of the state of the treasury.

SEC. 6. In consideration of the duties of the Recording Secretary, this Association will hold that officer exempted from all fees.

ARTICLE IV—MEETINGS OF THE ASSOCIATION.

SECTION 1. This Association shall hold its meetings semi-annually.

SEC. 2. The time and place of meetings shall be determined at the anniversary meeting by a vote of the Association.

SEC. 3. Special meetings shall be called by the President at his discretion.

ARTICLE V—MEMBERSHIP.

SECTION 1. Members of this Association shall consist of the following order of membership, to wit: Honorary, Corresponding and Active.

Sec 2. Honorary members shall be entitled to all the privileges of the Association, except voting and holding office.

Sec. 3. Active members of this Association shall consist of Practicing Dentists of good standing in this State.

Sec. 4. Members shall be elected by a two-third vote of the members present, and shall be entitled to the privileges of the Association upon signing the Constitution and paying into the treasury the sum of Five Dollars.

ARTICLE VI—FUNDS.

Section 1. Should the funds in the treasury be inadequate to meet the expenses, the Association shall levy a tax upon its active members to make up the deficiency.

ARTICLE VII—QUORUM AND AMENDMENTS.

Section 1. Seven active members shall constitute a quorum for the transaction of business.

Sec. 2. The Constitution can only be amended by a two-third vote of the members present at an anniversary meeting, after the proposed amendment has lain upon the table one year; said amendment to be read at the semi-annual meeting for information, or by the unanimous vote of all the members present at the meeting at which the amendment is proposed.

ARTICLE VIII—COMMITTEES.

Section 1. The President shall appoint at each anniversary meeting the following standing committees, to consist of not less than three nor more than five members, to wit: Executive Committee, Committee on Membership, Committee on Operative Dentistry, Committee on Mechanical Dentistry.

Sec. 2. Each committee shall be privileged to elect its own chairman.

BY-LAWS.

I. The President shall not discuss any question, except one of order, while he is in the Chair.

II. The President shall have the casting vote in the case of a tie.

III. The order of business shall be as follows:

1. Calling the Association to order.
2. Calling the roll.
3. Reading the minutes of the last meeting.
4. Election of members.
5. Election of officers.
6. Address of the retiring President.
7. Selection of place for next meeting.
8. Reports of committees.
9. Written communications.
10. Oral communications.
11. Unfinished business remaining on the minutes.
12. New business.
13. Reading, for correction, of rough minutes.
14. Adjournment.

IV. These By-Laws may be amended by a two-third vote of the members present at an anniversary meeting.

BROMIDE OF POTASSIUM IN DENTITION.

Dr. Salvatore Caro, in the *Medical Record*, strongly recommends the local application of this remedy to allay irritation of the gums in dentition. He says: "In the most severe cases of odontitis, either with or without ulcerated gums and loose bowels, I have never failed to relieve the child by the application of the bromide of potassium. Almost immediately after the first rubbing on the gums, from being turgid, swollen, and red, they assume their natural color, and a certain amount of ease is felt. Saliva commences to dribble; and, as if by enchantment, agitation, carpopedal involuntary motion, vomiting and looseness of the bowels disappear. As the vomiting and diarrhœa in this case are not the consequence of gastro-enteritis, but of an excitement of the stomach and the intestinal mucous membrane, owing to the inflamed condition of the gums, I suppose it will never be cured, either by scarification of the gums, or by the use of astringents or anodynes; but, as I shall hereafter prove, simply by the use of the bromide of potassium."

ILLINOIS STATE DENTAL ASSOCIATION.

The sixth annual meeting of the Illinois State Dental Association, held at Bloomington in May last, was one of the most interesting meetings of the kind which it has been our good fortune to attend. The attendance was large, and harmony and good feeling prevailed throughout the session. We have been present at the previous meetings of this body, and in contrasting the past with the present, we notice a marked improvement in the character of the discussions and the general interest manifested by its members in the advance of Dental Science. The topics selected for discussion at this meeting were varied and of a practical character. Interesting papers upon the different topics were read, and the discussion which followed was spirited, interesting and profitable. We would like, did time and space permit, to review the different papers. Through the courtesy of the Society, we lay before our readers, in the present number. the paper read by Dr. Cushing, on Heavy Foil, and hope to be able to give others in succeeding numbers.

Dr. Black read a very interesting and able paper on the treatment of exposed nerves. Following this paper the popular theory and practice of capping exposed nerves with oxychlorid of zinc was fully discussed. A paper by Dr. C. S. Smith, on Arsenious Acid, When and How to Use it—showed much thought aud study. Dr. M. S. Dean presented a very able paper on Complicated Filling, giving in detail his method of preparing the cavities, and filling the same with heavy foils. Dr. J. M. Crouse's paper on Separating Teeth, When and How, elicited a good deal of discussion. The Doctor advocated slow wedging—believed much injury resulted from the practice of rapid wedging—would separate the teeth of young patients, for examination, by pressure—had found many cases of incipient decay on the proximal surfaces of teeth after thus separating them. which would otherwise have passed unnoticed.

Dr. Cushing's paper on heavy mallets, which we will give our readers in the next number of the JOURNAL, was thoroughly discussed, and his views practically tested in the several clinics

during the session. Mallets of lead, tin, steel and wood, and of different weights were tried with varied results, the lead or tin being perhaps the one prefered.

Drs. Cushing's and Black's papers on legislative action seemed to meet the views of the Society, in reference to the importance of securing a law for the protection of the people against charlatans. Dr. Black would separate the two branches of the profession, and have a law passed restricting the operative and surgical department, allowing any one to construct artificial teeth. Dr. Cushing advocated the passage of a law similar to that already passed by other States. A committee was appointed to draft a bill, and to present it at the next meeting of the Legislature, petitioning for its passage.

The following resolution in reference to rubber was passed, unanimously:

"Resolved, That we disapprove of the use of rubber as a base for artificial teeth, believing that metallic plates, (gold) are cheaper and healthier for all classes of persons."

The following gentlemen were elected to fill the offices of the Society the ensuing year:

President — Dr. G. V. Black, Jacksonville.

Vice President — Dr. S. C. Wilson, Bloomington.

Secretary — Dr. C. S. Smith, Springfield.

Treasurer — Dr. G. P. Kingsley, Freeport.

Librarian — Dr. E. C. Stone, Galesburg.

Executive Committee — Drs. E. C. Stone, and E. F. Davis, Galesburg; Wilson, Bloomington; Edwards, Griggsville; and Miles, Jerseyville.

The proceedings of the Society are to be published in book form for circulation among its members.

The Society numbers about one hundred and fifty members, is in flourishing condition, and is doing a good work. One hundred and fifty dollars was subscribed by the members, at this meeting, to the Barnum Memorial Fund. The Society gave twenty-five dollars to the same object.

Adjourned to meet at Galesburg in May, 1871. E.

MISSOURI STATE AND COLLEGE ASSOCIATION.

The session which has just been held in this city, of the above Association, was marked throughout by the utmost harmony among the members, and also showed that the interest in meetings of this kind is steadily increasing in this vicinity, as indeed we believe it is in all places where dental organizations have taken place. Letters were received from a considerable number of practitioners from various quarters who were unable to attend, showing their full accord with the movement, which has so much to do in fitting us all for the responsible duties that devolve upon us.

We feel assured that those present at this meeting of the Association will all feel that they are better fitted to do justice to their patrons, than they would have been had they neglected to improve the opportunities which they have just enjoyed. We are most happy to be able to state that, of the dentists of St. Louis, not one was absent from the Association whose presence could have lent any additional interest or respectability to its deliberations, and we wish we could say the same of the rest of the State; for, although the rest of the State was better represented than at any previous meeting, still there was room for improvement in this respect, and we hope the next meeting will show a much larger proportion of the members of the profession from all parts of the State, outside of this city, present. As it was, we think there was in attendance a greater number from the country, than there were in attendance upon the State Medical Society that met here a few weeks since, which fact either speaks well for the dental profession, or it is very uncomplimentary to the medical fraternity.

In accordance with the requirements of the amended constitution, the officers for the next year were elected at the close of the session; Dr. J. C. Goodrich, of Wentzville, being elected President; Dr. M. McCoy, of Booneville, 1st Vice President; Dr. Edgar Park, of St. Louis, 2d Vice President; Dr. G. A. Bowman, Recording Secretary; Dr. J. N. Luckie, of Mexico, Mo., Corresponding Secretary; Dr. J. B. Morrison, Treasurer.

Drs. Aaron Blake, C. W. Rivers, E. McCune, and J. C. Goodrich, were elected to fill vacancies in the Board of Trustees of the Missouri Dental College.

The Association adjourned to meet again in this city, on the 1st Tuesday of June, 1871.

PROCEEDINGS OF THE SOUTH CAROLINA STATE DENTAL ASSOCIATION.

Held on the 5th, 6th and 7th of April, 1870.

A call having been made (by the members of an Association previously formed) for a new Association, that would embrace every portion of the State, on the day appointed a large number of gentlemen, representing the Dental interest of nearly every portion of the State, met in Columbia, and proceeded to form a "State Dental Association."

The following officers were elected to serve the ensuing year:

President—Dr. J. B. Patrick, Charleston.
1st Vice President—Dr. Wm. C. Wardlaw, Abbeville.
2d Vice President—Dr. H. R. Hanberry, Barnwell.
Corresponding Secretary—Dr. Thos. T. Moore, Columbia.
Recording Secretary—Dr. O. J. Bond, Marion.
Treasurer.—Dr. Theo. F. Chapin, Charleston.

The President appointed the following Standing Committees:

Executive Committee:—Drs. D. L. Boozer, G. F. Wright, A. R. Durham, N. Simms, Sam'l A. White.

Committee on Membership:—Drs. Wm. L. Reynolds, E. C. Jones, J. R. Thompson, B. C. Hart, Geo. H. Winkler.

Committee on Operative Dentistry:—Drs. O. I. Bond, Wm. C. Wardlaw, Thos. T. Moore, N. S. Brown, Theo. F. Chapin.

Committee on Mechanical Dentistry:—Drs. R. S. Whaley, W. A. Fallow, H. R. Hanberry, I. H. Alexander, B. A. Mackenfuss.

The following were elected delegates to the "Southern Dental Association:" Drs. I. B. Patrick, Wm. C. Wardlaw.

Delegates to the "American Dental Association:" Dr. Thos. T. Moore, Dr. H. R. Hanberry.

The delegates to the Southern and American Dental Associations, were instructed to use their influence in having a committee appointed to petition Congress to have Dentists appointed in the Army and Navy of the United States.

After a very harmonious meeting, the Association adjourned to hold its Semi-annual meeting in Charleston, in November next, and its Annual meeting in Columbia, on the first Tuesday in May, 1871, at 8 P. M.

THOMAS T. MOORE, Cor. Sec.

NATIONAL ASSOCIATION.

Those who intend to attend the National Association, at Nashville on the first Tuesday in August next, will bear in mind that the Iron Mountain Railroad will give round tickets from St. Louis to Nashville and back for $17; i.e., exactly one-half fare. We hope to see a large delegation from this vicinity, as there doubtless will be from all other quarters. J.

THE INDIANA STATE DENTAL ASSOCIATION.

The Indiana State Dental Association will hold its 12th annual meeting at Indianapolis, commencing at 2 o'clock, P. M. June 28th, 1870.

SUBJECTS FOR DISCUSSION.

1st. Hypodermic medication as it pertains to dentistry.
2d. What are the indications for destroying the pulp?
3d. Diseases of the gums and alveolus—and treatment.
4th. Filling teeth with gold.
5th. Treatment and preservation of the deciduous teeth.
6th. Miscellaneous.

Able papers will be presented by members appointed by the

President to open discussions, and a profitable meeting is certain. Members of the profession from other States are most cordially invited to participate with us.

W. C. Stanley,
A. O. Rawls,
W. L. Heiskell,
} Ex. Com.

JOHN F. JOHNSTON,
President.
SENECA B. BROWN, Sec'y.

AMERICAN DENTAL ASSOCIATION.

The American Dental Association will hold its tenth annual session at Nashville, Tenn., commencing at 10 o'clock, A. M., on Tuesday the 2d day of August next. The Secretary and Treasurer will be in readiness two hours earlier, for the purpose of examining credentials, receiving dues, &c.

I would suggest the following amended form for certificates:

"This certifies that ..... was duly appointed a delegate to the American Dental Association, on the ..... day of ..... 1870, by the Dental Society of ..... and that said .... is a Dentist of good character and standing, and at this time in regular practice.

The ..... Society has adopted, [or substantially adopted,] the code of ethics of the American Dental Association.

..... Secretary. ..... President."

"Each local society may send one for every five of its active members, and each Dental College one for its faculty, as delegates to this Association for one year, upon complying with the requirements of its constitution, but no society shall be entitled to representation, that does not adopt, or substantially recognize its code of ethics."—Constitution A. D. A.

M. S. DEAN, Rec. Sec.

OBITUARY.

It is with regret that we learn of the death of the wife of our friend and co-laborer in the profession, Dr. John C. Angell, of New Orleans. W. A. M.

From the Daily Hartford Times.

MONUMENT TO DR. HORACE WELLS.

At a regular meeting of the Hartford Society of Dentists, held at the office of Dr. C. M. Hooker, April 11, 1870, the following resolutions, presented by Dr. McManus, were adopted:

Resolved, That the natural gratitude due to the memory of public benefactors, imperatively demands that the city of Hartford and the State of Connecticut, with the Medical and Dental Professions, cause a suitable monument to be erected in the public park of this city, in memory of Dr. Horace Wells, the discoverer of anæsthesia.

Resolved, That Drs. J. M. Riggs, James McManus, E. E. Crofoot, C. M. Hooker, and Wm. Blatchley, be and are hereby appointed a committee, whose duty it shall be to cause suitable petitions to be presented to the City Council of Hartford and the General Assembly of this State in furtherance of this object, and to obtain signatures to the same.

LYON'S TOOTH TABLETS.

We have been using for some time past the above excellent dentifrice, and as it is no secret nostrum and has all the essential elements that a dentifrice should contain, we take great pleasure in recommending it to our patients and friends. J.

We wish to call the attention of our readers to the advertisement of Dr. Barnum, in this Journal. Dr. B. deserves well of the Profession. He has *given* it something very valuable in the *Rubber Dam*, which he refused to patent. Can those who appreciate the value of the Rubber Dam, by its use, do less than patronise the inventor by purchasing a superior article at a fair price. We have samples of his rubber which are as tough and elastic as could be desired. Gentlemen, send him your orders and they will be filled satisfactorily. C.

The Missouri Dental Journal.

A MONTHLY RECORD OF THE SCIENCE.

VOL. II.] JULY, 1870. [No. 7.

THE BOSTON MEDICAL AND SURGICAL JOURNAL.

This journal, which makes its appearance regularly every week, needs no encomiums at this day from any one to establish its high claim to consideration as one of the best medical journals published in this country.

But the "Boston Medical and Surgical Journal" has a hobby to ride; and whenever one has a hobby it is remarkable that instead of handling the reins himself, and directing its course in accordance with reason, common sense and common justice, it is too often the case that the hobby seizes the bit and carries the rider wherever it pleases. The hobby, that has for a long time past *directed* the course of this journal, is ether in its relation to anæsthesia. As a matter of course no other anæsthetic is worthy of a moment's consideration. Chloroform, nitrous oxide and all other means of producing anæsthesia are not to be compared in their beneficent effects to ether. Chloroform is so objectionable on account of the danger attending its use that many pages of the journal are taken up in recording the fatal cases that have resulted from its use, and many more have been used to explain satisfactorily those cases that have been reported as having proved fatal from the use of ether, whilst one from reading this journal alone would almost come to the conclusion that nitrous oxide has not yet been fully discovered at all. The velocity with which this hobby carries its rider along has been greatly increased by the whip and spurs furnished by the late Sir James Y. Simpson, of Edinburgh, and it has probably

dashed through some rather muddy localities, which even a *hobby* would have avoided had it not been for this super-stimulation.

We would, however, remark in relation to the controversy between this journal and its contributors and Sir James Y. Simpson, that the latter had also a hobby, which was chloroform, and as both parties were able and active, and have evidently put forth their best efforts, we must confess that it has not been a *scrub* race.

The last article upon this subject is from the pen of Dr. Henry J. Bigelow, one of the correspondents of the "Journal," and we notice it because it reflects, to a certain extent, the general characteristics of the controversy.

Speaking of ether, he says: "Its essential points should characterize every perfect remedial agent. Ether was the first anæsthetic proved to be inevitable as to the individual, complete in its effects, and safe. * * * Nitrous oxide, in the hands of Horace Wells, sometimes succeeded; but it also failed, as in his final experiment in Boston. * * * Modern dental anæsthesia by nitrous oxide must not be confounded with the uncertain process of Horace Wells. The modern method, by the large gasometer, is more successful; but this was not the method employed by him. His gas bag was liable to be inadequate, asphyxiating, uncertain. It was liable to fail. * * Horace Wells was not the discoverer of modern anæsthesia, *inevitable, complete and safe*—a *triple discovery*, involving three conditions, a notable failure to fulfil one or the other of which, as had happened in all previous experiments, would render it of little value. These three conditions were first fulfilled with ether. The discovery of modern anæsthesia was made with ether."

We propose to examine some of these somewhat remarkable claims set up by Dr. Bigelow in behalf of ether. "Its essential points should characterize every perfect remedial agent." And then, by way of explaining what those points are, he continues: "Ether was the first anæsthetic proved to be inevitable as to the individual, complete in its effects, and safe." We would like to inquire how many such remedial agents have yet been dis-

covered? We find them described in some of the flaming handbills and posters that itinerant quacks use so profusely, doubtless for the very philanthropic purpose of letting the afflicted know that they have discovered the medicine that is "inevitable as to the individual, complete in its effects, and safe." This is the highest claim that is set up even by the most unprincipled mountebank; and this is the claim, in plain words, set up by Dr. Bigelow for ether. It is scarcely necessary to remark that this is not acknowledged as having been demonstrated by the great body of the medical profession.

In other locations patients sometimes persistently decline to demonstrate the completeness of its effect; and even the few fatal cases that have been recorded against it, and which its advocates themselves conclude were at least partly due to the effects of the ether administered, do not seem to establish its entire safety. Had it merely been stated that ether was less dangerous than chloroform, few would have been found to dispute the proposition; but when it is claimed that it is absolutely safe in all cases and under all circumstances, we beg leave to dissent from all such extravagant pretensions. It is true that the communication does not say in so many words "in all cases and under all circumstances," but it does say "ether was the first anæsthetic proved to be inevitable as to the individual," which, if it means anything, indicates that it never fails in any individual case; indeed, the Greek idiomatic form of speech made use of in this case could not well be otherwise interpreted.

But the relative merits of ether and chloroform is not really the question which lies nearest the heart of the "Boston Medical and Surgical Journal." Boston has claimed for itself the honor of being the birth-place of modern anæsthesia; and were it not for the claim of Horace Wells, they would inevitably carry off the palm. A less enterprising people, however, would have abandoned the claim in the face of such difficulties as have to be met and overcome in a controversy of this kind; but no obstacles are too great to be surmounted when *manfully* and *vigorously* attacked by a *united* people. The fact stands out prominent and unchallenged that anæsthesia was produced two years earlier in Hart-

ford than in Boston. It was safely and completely produced by Dr. Wells with nitrous oxide; and if Dr. Jackson is entitled to a large part of the credit for the discovery of the anæsthetic properties of ether (as has been claimed by Jackson's friends), because he had suggested its use to Dr. Morton, we would like to inquire how much credit is due to Dr. Wells for having, by his experiments with nitrous oxide, suggested both to Morton and Jackson the feasibility of producing anæsthesia by inhalation? Is there any probability that either of them would have even given the subject a thought if the suggestion had not reached them from Hartford. But Dr. Wells failed at Boston to produce complete anæsthesia in a single case, and this is the foundation upon which this remarkable claim of Dr. Bigelow is based. We suppose no one ever failed with ether! No experiment was ever tried with it that was unsatisfactory! But "modern dental anæsthesia by nitrous oxide must not be confounded with the uncertain process of Horace Wells." We are to understand by this and the subsequent quotations that because Horace Wells did not discover all of the improved methods of administering nitrous oxide, that he is not entitled to the credit of discovering and demonstrating its anæsthetic powers at all. We suppose Fulton, upon the same grounds, ought not to receive any credit for demonstrating the feasibility of moving boats by steam because he did not make use of all the modern improvements in steam engines, and especially as his boat was small, inconvenient, and wanting in architectural beauty. Modern steam navigation must not be confounded with the imperfect method used by Fulton. The unwieldy and uncouth boat first launched on the Hudson by Fulton must not be confounded with the superb, elegant and swift steamers that now navigate our rivers, and plow with wondrous speed the waters of every sea, and ride in triumph through the storms of every ocean. Therefore Fulton is entitled to no credit as he was not the discoverer in *modern* steam navigation.

But it was not demonstrated by Morton that ether was inevitable as to the individual, because that cannot be demonstrated absolutely till every member of the human family shall have

tried it. As the absolute effect of no remedial agent can be predicated farther than actual demonstration has taken place, all such claims to infallibility should be left to those who are always ready to claim that the particular nostrum which they are interested in introducing to the public, is inevitable as to the specified case for which it is recommended. A few words in relation to the discovery of Wells, and we have done with this subject. Horace Wells discovered and demonstrated the anæsthetic properties of nitrous oxide. His demonstrations sufficed to show that it was complete in every case when the experiment was fairly tried, and, so far as he tried it, was safe, which is all that Morton can claim for ether; whilst the claims of Wells have the advantage of *two years priority* in point of time, so that the discovery of Morton was undoubtedly dependent upon Wells' discovery, and years of trial have shown that nitrous oxide is, to say the least of it, as nearly "inevitable as to the individual, as complete in its effects, and as safe," as ether, whilst it is much more rapid in its action, much more pleasant in its effects upon the patient, and is used at the present time probably twenty times where ether is used once. J.

PROFESSOR NOEL'S REPLY.

In the April number of the JOURNAL, we passed in review the principal articles found in a previous number of the "American Journal of Dental Science," and among the rest one by Prof. Noel, upon the histology of the dental tissues. To some of our views, as then expressed, the author of the article referred to objects, and replies at considerable length in the June number of the "American Journal." As the subject itself is one of interest to the whole profession, and as it is important that all new doctrines should be carefully examined, we shall offer no apology to the readers of the JOURNAL, for referring again to this topic.

We do this, however, with no captious intent of defending positions, which we may have previously taken, simply because

we have committed ourselves thereto, but for the purpose of arriving at the truth. The assertions by the author that "Fresh dentine has no tubuli, but has uncalcified fibrillæ solid or nearly solid," also, "that the tubuli found in the dry tooth, or dead and dry teeth, are formed by the desiccation and evaporation of these dentinal fibrillæ, and have no existence in the living tooth," were very briefly commented on, and have brought forth a rather spirited reply. The author complains that we have based our argument upon the unauthorized assumption that there are hollow rods in fresh dentine. The only difference in the author's views and our own upon this point is simply one relating to the proper nomenclature to be employed, and that, i. e., the nomenclature made use of, was what we had reference to when we referred to the *conversion* of hollow rods into fibrillæ, as doubtless our readers generally understood. We would remark, in the first place, that a hollow body is not necessarily one that has a vacuum within it, as the heart is a hollow organ, which is filled with blood; and the venous and arterial *tubes* are, nevertheless, hollow *tubes*, even if the blood in them has not been desiccated or evaporated. Now, if the fibrillæ of the dentinal organ are calcified upon their surface, whilst their central axes are fluid, or at most, soft solid, are they not tubes just as much before their contents are desiccated or evaporated, as they are after those changes have taken place, which have reference only to the contents themselves? Therefore we do not think that the "tubuli found in the dry tooth, or dead and dry tooth, are *formed* by the desiccation and evaporation of these dentinal fibrillæ, and have no existence in the living tooth." We prefer, therefore, to speak of dentine as made up of a connective tissue base, which, with the lime salts deposited in it, assumes the form of tubes radiating from the periphery of the pulp to the periphery of the dentine. We enumerate, also, as a part of the dentine the contents of the tubuli just as we would in describing the cementum or other bones, include its connective tissue base and salts, the contents of the lacunæ, and when Haversian canals are present, their contents, that is to say, the veins, arteries, absorbents, &c., are as much a part of a bone as is the

phosphate of lime or its connective tissue; consequently we should differ again from our author in our description of dentine, as he states that "all dentine is calcified fibrillæ," whilst we consider the nuclear matter of the dentinal tube, as well as the uncalcified formed material, as parts of the dentine. But enamel and dentine are not vitalized tissues, so far as their *calcified* portions are concerned. "Enamel is dead, perfectly dead," &c. The author does not deny but that the enamel organ and the dentinal organ were vitalized structures up to the very moment that calcification took place, when they became enamel and dentine, consequently dead tissues. We would ask, "What are the evidences of their death?" There is no proof that any change in this direction in the connective tissue base of these structures has taken place at all. The salts may be removed, and the base, at least in dentine, remains in them apparently as perfect as it was before the deposition of salts took place. It was a soft tissue before and it is a soft tissue after the salts have been removed from it; and we have no reason to believe that no vital changes have taken place in this organic base whilst it has been surrounded and infiltrated with inorganic matter. But as the author has seen fit to give us his definition of a vitalized tissue as one "changing under vital forces—exhibiting the three forces of organic life, (1.) assimilation, (2.) propagation, (3.) development"—we would simply state that we consider a tissue vital which has the power of assimilation, without any reference to its propagating or developmental powers. Now, so far as any light has been thrown upon this subject, in reference to enamel and dentine, it goes to show that nutrition does take place in the organic base of these tissues. It has not only been observed by dental practitioners that the teeth grow harder as age advances, as is universally acknowledged, but that they also, under certain circumstances, grow softer, or at least more friable. It is well known to dental practitioners that where the pulp of a tooth has been destroyed, and all "vascular and nervous supply" cut off, that the dental tissues become more friable and more liable to decay. At least we think this will accord with the opinions of a great majority of the most reliable and observ-

ing men in the profession. We do not claim for this argument the force of a demonstration upon this subject, but it is at least entitled to more consideration than a bare supposition that has no single fact to which one can point that can in any degree relieve its inherent weakness. It has not yet been demonstrated that nutritive changes do not take place in the organic bases of dentine and enamel; but, on the other hand, we think that all the light we have upon this subject would lead us to an opposite conclusion.

In reply to an assertion of ours, that constant change is stamped upon every atom of matter throughout the universe, the author says: "Every atom of matter in the universe may be under a law of 'incessant change,' but if the changes are to us inappreciable, I contend that it is not proven. * * * I have a friend traveling in Europe; he writes to me that he saw at a cathedral a molar tooth said to have belonged to one of the apostles or bishops of the early Church, evidently some hundred years old. Now, perhaps the 'organic base' of the enamel of that tooth has been undergoing constant change for the last eighteen hundred years, or at any rate, a great number of years; but my friend failed to appreciate it, for he said it was a fine tooth, in a state of excellent preservation."

We will suppose that side by side with the "molar tooth" lay the foot of a live frog, *apparently* motionless, a microscope would have revealed therein a field of activity truly surprising—blood corpuscles rushing through veins and arteries—leucocytes creeping along the inner walls of the various vessels—pigment cells scattered along here and there, altogether forming a scene of wondrous magnificence and beauty—but his "friend" would have failed to have appreciated it. A glance by the naked eye could not have revealed these wonders. So these changes of nutrition and decomposition, although no less certain or wonderful than the changes in a frog's foot, are not usually appreciated upon a mere casual observation.

But it is objected that we have cited *sensibility* as one of the signs of vitality. After stating that enamel is "perfectly insensible," he qualifies this by stating that "if enamel ever gives

evidence of sensibility, it must be in extremely rare cases, and only when the dentinal fibrillæ have been prolonged into the enamel organ, and have escaped calcification, thus giving an unbroken line from enamel to pulp." We have only to remark in relation to this that the condition described by our author above is not, according to our observation, very rare, and that it is not certain but that that very state of things always obtains. We have no doubt but that the sensitiveness of enamel is due to the extension of the dentinal tubuli with their soft contents into the enamel.

Tomes states that in a well developed tooth a certain number of the dentinal tubes will be seen to pass across the line which marks the junction of the enamel and the dentine, &c., * * but in teeth of less perfect organization, the dentinal tubes, often passing into the enamel, become suddenly dilated into comparatively large, elongated cavities. As the author says, "The pain in decay is dependent upon the dentinal fibrillæ." And as we have just shown that even in well developed teeth, the *fibrillæ*, or tubes, are continued into the enamel, would we not reasonably conclude that we should sometimes have *sensitive* dentine, even if our every day's experience did not demonstrate that it is so.

But again controverting a statement that we had put forth, to the effect that sensitiveness is one of the most certain signs of vitality, wherever it exists, he says: "Sensitiveness is not one of the most certain signs of vitality wherever it (vitality) exists, nor wherever it (sensitiveness) exists (sentence capable of each construction, and wrong in each)." Now, in relation to the first construction, and the only one which is here argued by our author we would say that, construed in that way, it would be evident to the merest tyro that no argument could be made in its favor, so that all the labor expended in that direction was thrown away; but with the second construction, which our author acknowledges to be also legitimate, and which we intended should be placed upon it, the case is entirely reversed, no argument of any force can be made against it. In order to controvert this it must be proved that sensitiveness can exist where

there is no vitality, a task which, we presume, will not be hastily undertaken.

In relation to the development of the "dentine organ" the author says: "Simultaneously"—that is, at the same time that masses of germinal matter make their appearance upon the inner surface of the tunica reflexa—"there is found upon the external surface of the pulp, i. e., external to and resting upon the tunica propria, masses of germinal matter, which grow towards the germinal matter projecting from the surface of the tunica reflexa until they meet at the line of conjunction." It is at once evident that, according to this description, the tunica propria separates the dentine organ from the pulp. In the author's reply he says that the fibrillæ of the dentine organ blends in organic continuity with the pulp tissue. If so, what has become of the tunica propria? Now, it has been held by nearly all of the best histologists of the last twenty-five years, at least, that the dentine was formed beneath the tunica propria. Beale, however, dissents from this view, but he does not state that the dentine organ is formed by *germinal matter, external to and resting upon the tunica propria*, as that would not accord with his views concerning the relationship which exists between the dentine organ and the pulp, for speaking of the cellular elements of the dentine organ, he says these elongated cells are not separated from the nerves, vessels and connective tissue of the pulp by a demonstrated basement membrane, but their extremities pass amongst the fibres of the connective tissue, and, in some instances, seem to be continuous with them. We, therefore, very naturally remarked in our first article, "that it would be new to our readers that the dentinal organ is formed external to the tunica propria," &c. J.

A CALCIFIED PULP.

Case.—Woman, thirty years old; left upper canine decayed on distal surface, from the cusp to the neck. In the prepara-

tion of the cavity I find hard and flint-like dentos occupying what was once the pulp cavity. The dentine on each side of it is so much softened that there is a deep groove on each side of the calcified pulp, which latter projects out nearly its whole diameter into the cavity. If this calcified pulp had dentine tubes it would undoubtedly have decayed as the other portions have; but as it is so intensely hard it must be compactly calcified, and it is certainly as hard as the best enamel.

I should be glad to have an opportunity of making a microscopical section of this pulp. Many calcified pulps are not changed into dentine, but merely hardened with lime salts in a homogeneous manner, and no differentiation of histological tissue takes place. CHASE.

Operative and Surgical Dentistry.

CHILDREN'S TEETH.

The sixth year molars are often erupted with open fissures in the enamel. If these remain open two years they are likely to become extensively decayed. Children at seven years of age are not proper patients for the plugging of the fissures with gold. If it is undertaken failure will be apparent, by a continuation of decay, in two or three years, and the operator will be blamed. At ten or twelve years of age gold operations can be more successfully employed. Something must be employed at the early age of six or seven years that will be quickly manipulated, and fill the fissures so as to arrest decay.

Amalgams I am totally opposed to, on account of their constitutional and chemical effects. Osteoplastic, os artificiel, ox. chl. zinc, are used indiscriminately by me for these cases.

CASE.—I have just dismissed a sweet little girl, seven years old; good natured and patient, but who could not keep still half long enough to insert a gold plug. The four sixth year molars have

been erupted six months. There are deep and very narrow fissures in the enamel of the two under ones. The crowns are considerably *cupped*—concave. There are several ridges, between which there seem to be no fissures. I widen the fissures a little; not enough for a gold plug. The *dentine* is white, soft, and like wet plaster of Paris in the fissures. I shall not deepen the latter for fear of removing lime salts, that by remaining quiescent will harden in the dentos. I know by experience that I could go on and cut, and cut, until the pulp is nearly exposed, and still find the same soft material in the fissure.

We should be careful how we *waste* the dentos of children. A great deal is unnecessarily cut away by hundreds of fair operators. Much of the material thus lost would harden, if l t alone, under a plug.

I shall fill these *prepared* fissures with ox. chlo. zinc. I turn upside down the glass cover of a tooth powder box. A large drop of acid is put in the corner, and a sufficient quantity of zinc powder *near* it, not in it. I shall mix it with a small, smooth stick of hard wood when I get ready. I have a little, short bottle, containing white gutta percha, dissolved in chloroform, at hand. Put a piece of spunk under the tongue, and a small napkin on the latter, a small piece between the cheek and the molar. The tongue must be depressed while the *filling* is placed, so that the latter may be kept *dry* until hard. Now I am all ready. Wipe the fissure and the crown of the tooth dry. Mix the ox. chlo. zinc to a *thin* paste, and place it in the fissure and cup of the crown. With a piece of spunk, half the diameter of the crown, press the filling into the fissures. The spunk will also immediately absorb all unnecessary acid. Rub the spunk over the surface of the filling to smooth it. Now, with the plyers and another piece of spunk, take some gutta percha from the bottle before mentioned and varnish the plug. Let it dry a moment, and then I will relieve my little patient by letting her evacuate the mouth. The object of the gutta percha varnish is to keep the saliva from the ox. chlo. zinc for a few hours. One who has never tried it will be surprised to see how hard a plug of this kind will get in a few hours, if treated in this way.

I cover a considerable portion of the crown with the filling. The occluding teeth do not often *fit* into the cupped crown until some years later, so that these plugs are not in the way. The crown will be well protected for some time. Will this plug *last?* Probably not more than one or two years. It may be renewed or mended when necessary, and when the child is ten years old fill with gold. CHASE.

FILLING TEETH.

CASE.—The right under first and second molars stand closely together. Enamel touches at a portion of their approximal surfaces. No appearance of decay, but patient complains of an uneasy feeling between them at times. The *smallest* excavator discovers a cavity, about a line in width, just above the margin of the gum in each tooth. These cavities were found by introducing the excavator between the necks of these teeth, and carrying it upwards. Directly from the buccal surface no cavities can be felt, as they do not extend far enough for that. The teeth are in contact at their grinding approximal borders.

APPROACH TŌ THE CAVITIES.

How shall we do it? The teeth are sound on their grinding surfaces, therefore we will not cut through this surface. If they were the second or third molars in *this* mouth we would do it. But we can approach these cavities and plug them from the buccal surface of the teeth.

With small drills and bent chisels I cut a slot through the sound dentos*, in a line horizontal with the cavities, until I reach the latter. The slots are made of the same external diameters as the cavities. The buccal ends of the slots are dovetail shape. The lingual ends of these cavities are undercut a trifle, just enough to feel that an instrument pressed against them would not easily slip out. The margins are made smooth and continuous. The teeth are filed apart with a "No. 1 Froid." The cut

*Tooth substance.

surfaces are then polished with corundum tape and diamond powder on chamois. The mouth has been so wet thus far that I have been obliged to use the tongue holder and napkin. The cavities are now ready for

PLUGGING.

But how shall they be kept dry? To some operators the rubber dam would be indispensable. It will be very much in my way, as the mouth is small. The shape of the teeth is also unfavorable for its use. I can succeed with spunk. A square piece is placed over the mouth of the left parotid duct, and held in position by the compressor. One piece is cut to fit the floor of the mouth, and slit on one side to admit the frenum of the tongue. This is placed in position, and the tongue compressed upon it with the tongue holder, having a narrow folded napkin between it and the tongue. A piece of spunk is also laid over the right parotid duct. Each of the portions of mucous membrane to which spunk is applied should be previously wiped dry, as the spunk then adheres to it very closely, and more effectually closes the ducts. One minute will suffice to thus prepare the mouth with spunk, and it will be kept so dry that the napkin on the tongue will hardly be moistened at the end of the operation. In the case I am describing it was true.

And, let me say, that my *cases* are not *made up*, they are all descriptions of actual operations performed by myself. As I have at other times remarked, I do not select the more difficult cases to report, but take those which I think will be of the most practical benefit to my young readers.

INTRODUCING THE GOLD.

I shall plug the second molar first. It is on the anterior approximal surface, as has been already described. I use No. 4 Abbey's foil, twisted into a solid rope, and cut into pieces a little longer than the depth of the cavity. I introduce one carefully, and slide it along with the *foot* plugger to the distal end of the clot. It will be remembered that these cavities are like an open canal, the bottom being a little wider than the sur-

face, thereby causing a section to appear *dovetail.* This first piece is well malleted, and so are the successive pieces which I continue to introduce, until only a small opening near the buccal end of the cavity remains to be plugged. I now place a bit of sponge gold against the surface already condensed, and mallet it. Now I add adhesive foil, No. 30, to it, and finish the operation with the latter number, using the mallet. The cavity is more than full, and projects into the space between the teeth. The "No. 1 Froid" which was used before is used again to remove a portion of the surplus gold. This plug is now left until the opposite one is filled. This is on the posterior approximal surface of the first molar. The *compressors* are removed from the ducts, and the patient allowed ten minutes rest. This cavity is of the same shape as the former one just plugged, and is plugged in the same manner; the ends of the cut rope are allowed to press firmly against the opposite tooth and plug, and are thus held firmly in place. The reason of plugging the distal cavity first was to take advantage of this, the second cavity, from its situation, being a little more difficult to get at. The "Froid" is again used, and then corundum tape, with diamond dust, chalk and chamois skin, give the finish.

CHASE.

SEPARATING TEETH.

By G. V. BLACK, Jacksonville, Illinois.

Much difference of opinion exists among the members of the dental profession in regard to the manner of separating teeth for the purpose of obtaining room for filling cavities in proximal surfaces. The plan first used, we believe, was that of filing away the tooth sufficiently to obtain the required space.

This has been abandoned by the majority of the better class of operators, for the reason that in the front teeth it spoils their shape and mars their beauty; and in the bicuspids and molars, for the reason that the food presses into the space left

and down on to the gum in such a manner as to make mastication painful, and interfere with its perfect accomplishment. These reasons are sufficient, we think, to condemn this plan, except in some rare cases, such, for instance, as where a bicuspid or molar is so much weakened by a proximal decay extending far into the body of the tooth that the remaining shell cannot be trusted to hold a contour filling. Here the file may properly be used to remove the thin proximal margins, leaving a V-shaped opening between the teeth, and reducing the grinding surface so much as may be necessary, or until the surface is so small that the tooth will be able to withstand the pressure brought against it in the act of mastication.

This is on the principle that the half of a molar or bicuspid is better than none at all, and it should be confined entirely to such cases.

This can in no case apply to the incisors. Here we must save as much of the tooth as possible, and strengthen it, if necessary, by anchoring the filling low down in the root of the tooth. If there is a portion of the tooth's shape lost, it should in all cases be restored with gold—a contour filling. I cannot now think of any case of this class that would justify any other procedure. The filing away of one side of an incisor, and leaving the tooth misshapen, after being filled, is justifiable in no case.

As we cannot justify the use of the file to obtain room for filling, we must employ some other mode, for no proximal cavity should be filled without sufficient room to enable the operator to pass instruments freely into it at every point and between the proximal teeth. No perfect filling can possibly be produced without this; for supposing that the filling can be properly introduced—as in the proximal surfaces of the bicuspids or molars when the crown has been cut out so as to give free access to the cavity—it can in no case be properly finished without room to pass finishing files and tape between the two in order to properly trim and polish.

This space is obtained by forcing the teeth apart by wedges. How this may best be done is the question. Many plans have been proposed, and several are still employed. The required

space can be obtained by the judicious employment of any of them; but the grand question is how to do it with the least pain to the patient.

With the molars and bicuspids, where the teeth are brought into active use in masticating food, I have found the following to work well, when I have had sufficient command of the patient's time: Cut into the cavity from the crown as usual, and prepare it as perfectly as possible without separating; fill the cavity with gutta percha, letting it extend firmly against the opposite tooth, being careful not to press it too much against the gum between them; then dismiss the patient for a week, with instructions to take especial care to chew their meat and such food as much as possible upon that filling. This will almost insensibly spread the gutta percha filling, and wedge the teeth apart sufficiently in a week's time to give sufficient room without producing soreness. If the wedging be too rapid at first, and slight soreness occurs, the patient will insensibly avoid using that side, and thus the matter will be regulated. In patients who eat little or no meat, or food of like consistence, this plan will fail, for the reason that sufficient force will not be brought against the gutta percha to spread it and force the teeth apart. The facts necessary to avoid mistakes of this kind can generally be obtained from the patient beforehand.

When the separation cannot be accomplished by this plan, I know of no better mode than direct wedging.

With the incisors we cannot employ the gutta percha as described for the bicuspids and molars, and must resort to wedges. The best plan I know of is that commonly known as quick, or direct wedging, in distinction from slow wedging. The best wedge, in my opinion, is made from the toughest, hardest hickory, trimmed to a very gradual taper with a sharp knife, and then thoroughly burnished with a steel burnisher to consolidate the fibre and render it perfectly smooth, so that it may slide between the teeth with the least possible friction. Start this between the teeth just below the cervical margin of the cavity with the left hand, and with the right pass a very thin knife or lancet blade between the teeth, and force them apart by

pressing it down between them, and at the same time press in the wedge with the left hand. Care must be taken not to injure the enamel of the tooth with the steel blade, which will rarely be done if the blade be thin and pliant, unless the teeth be unusually soft or much weakened by decay. In either case the operator can easily judge of the force he can prudently employ. Soft teeth are always easily spread apart, so that much force is not necessary. In perhaps a majority of cases in young patients it will not be necessary to use the mallet at all to drive the wedge; but in case the teeth do not yield sufficiently without, having an assistant at hand, let her strike the wedge a sufficient blow with the mallet to accomplish the object, while the operator is doing what he can with both blade and wedge. In this manner the separation is accomplished with comparative ease, but of course not without pain.

I have faithfully tried every style of wedging that seemed to promise ease to the patient; have used a single wedge, driven without other help; have used two, driving one broad one near the cutting edges, and have used the third to protect the gum; but none of them accomplish the object so easily as this, or with such facility or certainty.

The material of which the wedge is formed is of much importance, as is also its shape. The wood should, if possible, be hard enough not to be much compressed by the teeth in passing between them, otherwise a shoulder is formed against the teeth, and it slips with great difficulty, and much of the force employed is lost in overcoming this trouble. For this reason the orange wood sold for this purpose is wholly unfit for use. Pine, or any kind of soft wood whatever, is liable to the same objection. The hardest wood, of fine, tough fibre, which can be obtained, is the best.

I have made considerable effort to relieve patients of the pain of quick wedging by wedging very lightly, cutting close, and allowing the wedge to swell with the moisture, and repeating the process until the necessary room is obtained.

I know that some operators think well of this method, but my patients, after a trial of it, universally prefer the quick

wedge as I employ it. Many of them say that if it could be done without any pain or soreness whatever, they would rather have the quick wedge and be done with it, than to be annoyed with something between their teeth for a week.

Rubber for this purpose is not to be tolerated at all, for it uniformly produces soreness, and is exceedingly annoying to the patient by the constant pressure it exerts. It is possible to separate teeth almost without pain by very light wedging with soft wood previously compressed, if it is changed often enough; but I have not yet found the patient timid enough to prefer the trouble it entails to the quick wedge rightly used. If teeth are difficult to separate with the quick wedge, they are also difficult to separate with the slow wedge, so that there is nothing gained.

Operators seem to differ as to the amount of room necessary for an operation. As a rule, I only want room enough for a number one separating file to pass easily between the teeth. This gives room for very light sandpaper and finishing tape; with these a good finish ought to be made in any case.

It may be urged that this does not give sufficient room for pluggers and the introduction of gold. When it does not, I prefer to obtain the required room by cutting away the tooth either from the lingual or labial wall of the incisors, and from the grinding surface of the molars and bicuspids, and supplying the place with gold.

I consider this preferable to severe wedging, even though it cause the filling to show when it otherwise would not. That much harm may be done by severe wedging there can be no doubt, and it should always be done with great care, and especially should great care be taken in separating the central incisors for young patients. The suture joining the superior maxillary bones may be spread open, and very grave injuries inflicted if the wedge be driven too severely, and the pulps of any of the teeth may be destroyed by excessive wedging.

In those cases where the teeth are most easily separated by the wedge, we should be most careful, for if they yield readily we are more liable to spread them apart too much, and do them injury; therefore good judgmen tand much caution should be exercised.

ALVEOLAR ABSCESS.

[*Continued.*]

The first result of inflammation that merits our attention is a serous exudation, sometimes escaping from serous surfaces into closed cavities, constituting the various local dropsies, and some times infiltrated into the areolar tissues, and finding its way between the elementary parts of various organs, when it is known as an œdema. The swelling in acute inflammation is, to a considerable extent, due to this œdematous infiltration, though the congestion of the vessels, and subsequently the exudation of coagulable lymph, or the fibrinous exudation, as it is designated by Virchow, contribute also to this end.

The second event referred to above is usually indicative of a higher grade of inflammatory action than that which is present when serous exudations take place, and inasmuch as these fibrinous exudations only take place in certain organs, it has been claimed by Virchow that they were not, in the strictest sense of the word, exudation at all, but that the fluid exuded from the blood received its distinctive characteristics from the tissue in which it is infiltrated, and consequently that it is a "local production." Without discussing this question it will suffice to state that this exudation, or production of fibrin, does take place, and gives rise, when infiltrated among the tissues, to the hard, almost cartilaginous, consistence found in phlegmonous inflammation, and sometimes to organized fibrous tissues, when it is effused upon mucous or serous surfaces.

The third result, suppuration, is the one which particularly attracts our attention in alveolar abscess, as the inflammation seldom proceeds further than the suppurative stage in this disease.

In a few cases, however, the intensity of the inflammatory action suffices to reach the last result, or, as it may with propriety be called, the final termination, that of death of the parts involved in the inflammation; only one other termination being possible, that of resolution.

With these facts before us we cannot fail to observe that no one course of treatment will suffice for all of these different conditions.

The treatment which would be perfectly adapted to one stage would be totally useless, or even injurious, in another stage; and the practitioner who fails to diagnose accurately the stage of the disease, as well as the disease itself, will inevitably fail to apply the proper remedies at the proper time, and in the proper manner to accomplish the desired result.

It is a very common practice with authors and other teachers to direct that the treatment of a given disease should begin by the removal of the cause, and few seem to have made the discovery that in a great majority of cases which fall under the eye of the physician, it is only the events or results of preceding pathological conditions that need attention.

The cause which first set in motion the morbid processes has long since ceased to act, and we shall only waste our time and energies in looking for a cause which no longer exists. For instance, an inflammation springs up from exposure to atmospheric changes of temperature, or possibly of electricity, and we probably first see the case days afterwards, and the events of inflammation require treatment, but the causes of the disease have already passed away. We see a case of small pox or measles, and we treat the conditions as we find them, and the complications as they arise, but of the cause we know nothing definite; and so far as our treatment is concerned, causation in these cases is not brought into consideration at all. Typhoid fever and cholera, and, in fact, a great majority of the diseases to which flesh is heir, belong to the same category.

Fortunately for us, and for our patients, we have a little more light in relation to the cause of alveolar abscess than we have in relation to the causes of most other affections, and we utilize this knowledge, both hygienically and therapeutically.

We are pretty well assured that some of the elements resulting from decomposition of a tooth pulp, when brought in contact with the periosteal structures at the apex of a fang of a tooth, act as the irritant agent which lights up an inflammation there

and leads to alveolar abscess. We are very certain also that in many cases this cause of a diseased action is persistent, and that we can and must remove the cause before we can cure the disease.

We have learned also to avoid bringing about this condition by our own manipulations, so that this knowledge is important also in a hygienic point of view, so in many of these cases we can commence our treatment by removing the cause.

HEAVY MALLETS.

Read before the Chicago Dental Society by Dr. G. H. Cushing.*

In speaking on the subject of heavy mallets, I beg to say that when I proposed to write upon this, I hoped to be able to present some approximate explanation of the philosophy of the mallet; but I shall make no such presumptuous attempt. Some articles have been written upon this subject, and from one, by Prof. Watt, it would seem as though the matter might very easily be explained. My own researches and experiments do not lead me to that conclusion, and I shall only very briefly refer to the philosophy of the subject, and state the results of practical observations, and of some few experiments instituted in the effort to elucidate the subject. The whole doctrine of "impact" is involved in this discussion, and it is one which, it would seem, is but little understood even by scientific men. In my endeavors to get light upon this investigation I wrote to the editors of the "Scientific American," who replied to me that they "knew of no work treating of 'impact' in other than a mathematical way." They say "the subject is only amenable to mathematical investigation, and hence it is difficult to give a clear exposition in ordinary discussion."

But we can speak of the facts which observation and experience have established.

* The first part of this paper, relating to Heavy Foils, was published in the June number of the Journal.

What we require in a mallet is, that it shall impact the gold properly, with the least possible injury to the tooth and the parts surrounding it, and the least discomfort to the patient.

The theory of Prof. Watt, and probably of many others who have never used the heavy mallet, is that a light elastic mallet is better than a heavy non-elastic one, for the reason that the momentum of a light elastic mallet equaling the momentum of a heavy leaden one, being secured by greater velocity, imparts its force so quickly that there is no time for its distribution, to any extent, beyond the tooth itself. Now, if the force were not diffused beyond the tooth at all, or were we operating upon mere inanimate matter, this theory would all be very well. But we are operating upon living, sensitive tissue, with all the physiological conditions qualifying it, and with the light mallet the force is diffused beyond the tooth, *only* enough to occasion sometimes great soreness of the periosteum, and to render the operation consequently very painful.

Now, the heavy leaden mallet, moving at much less velocity for the same momentum, has its force diffused very much more, so that in a certain sense the jaw and the head divide the force of the blow with the tooth and its immediate surroundings.

Experience demonstrates that as a rule the heavy leaden mallet is by far the least disagreeable one to the patient, while impacting the gold equally as well as the light elastic mallet; and my theory is that it is for this very reason, because the force in that case is more diffused than when the light elastic mallet is used. And I think this is clearly reasonable in view of what has been stated above.

But it does not clearly appear why there should be so very great a difference. There seems to be something in the character of the blow, dependent upon the material used, which has a modifying influence.

Mallets of almost every description have been used—lead, steel, copper, wood, ivory, hard rubber, and rubber or wood-faced mallets, with springs to break the force of the blow. You will find advocates for each and all of these various kinds; but I feel very confident that when the matter has been fairly tested

the conclusion will be universally reached that an uncovered leaden mallet, weighing from six to eight ounces, will be preferred by nine-tenths of those upon whom they are used, and that the gold is equally as well and satisfactorily condensed.

I have personally tried, faithfully, the light wooden, the light leaden, the light hard rubber, the steel, and the heavy leaden mallet, trying them all in the same mouth, and comparing them daily for several months, and have come to the conclusion stated above, that the heavy leaden mallet is universally preferred, except in very rare cases.

While attending the Mississippi Valley Dental Association, held early in March of this year, Prof. Watt detailed some experiments which he had been making to demonstrate the action of different materials, and of different weights of the same material, as mallets; that is, as to their relative "vis viva," or the amount of work which they would relatively accomplish in the way of impact before coming to a state of rest. The experiments which I afterwards instituted myself were suggested by those of Prof. Watt; and as I thought his apparatus not so constructed as to be uniformly accurate in its operation, I had mine made with a view to the greatest possible accuracy, and the results of my experiments satisfied me that the apparatus was all that could be desired for the purpose. It consisted of an upright board, eighteen inches high by three feet wide, set in a base of wood eight inches wide, thus making a platform at the base of the board in front, three inches wide. From in front of this board at its central point was suspended, by means of an arbor running accurately in close fitting journals, a pendulum of steel wire, which could be lengthened or shortened at pleasure, and to which mallets could be attached of any size or material. Upon the platform at the base of the board, running in grooves of brass, its base resting on the platform of wood, was a brass box, weighted inside with lead, about five inches long by two inches high, and one and a half inches wide, weighing altogether about three or four pounds; and upon the top of this brass box a steel bar was accurately fitted to move lengthwise upon the box in nicely adjusted bearings; a set screw with a spring ad-

justed the tension of the bar at will. Opposite the bar and also the brass box were fixed graduated scales of twenty-fourths of an inch. These being set at zero, and so that the end of the bar should just touch the end of the mallet when it was hanging at rest, the mallet was drawn to a certain point and dropped, striking the end of the bar at the point of the greatest momentum. The results of the blow were then evident, of course, upon reading upon the graduated scales the distance passed over by both the bar and the brass box, and thus was seen the relative effect of the blow upon the bar and the whole mass.

In this way, by comparing the results of blows produced by different mallets, was seen the difference in the diffusion of force due to the difference in character of the material composing the mallet, as well as the difference of "vis viva."

The experiments were limited for want of time, and not of sufficiently varied a character to demonstrate all that we seek to know; but they were somewhat astonishing in some respects, and, I think, contrary to the generally accepted theories concerning impact. I will briefly detail the experiments, which were conclusive as far as they went. They were each repeated eight times or more with most *remarkably accurate* coincidence of results. But one blow of the mallet was struck in each experiment. The spaces on the graduated scales will be designated as degrees:

Lead mallet drove the

Steel bar 4 degrees; whole mass, .5 degree.

Lignum vitæ, same weight:

Steel bar, 5 degrees; whole mass, .1 degree.

Lignum vitæ, with lead ends, same weight:

Steel bar, 4.5 degrees; whole mass, .1 degree.

Soft iron, same weight:

Steel bar, 5 degrees; whole mass, .4 degree.

Soft, pure rubber, same weight:

Steel bar, 4.5 degrees; whole mass, .4 degree.

The diffusion of force is apparent upon comparison of the distances passed over by the whole mass, and the steel bar moving upon the mass; the greatest diffusion, of course, being where the

whole mass was moved the greater distance relatively to the distance passed over by the bar in the same experiment. Thus it will be observed in the first four experiments the lead seemed to exhibit the greatest diffusion, and the lignum vitæ the least, while the soft iron would seem to have the greatest amount of "vis viva." In these four experiments, then, it would seem to be fair to presume that the difference in the diffusion of force here evinced was due to the difference in elasticity of the materials used as mallets, the more elastic showing less diffusion; but when we examine the record of the experiment with the soft rubber, we find that the diffusion of force in this experiment seems to be equal, if not greater, than in the case of the lead mallet, and its "vis viva" to bear the same relation to the lead that its diffusion does. This certainly seems strange, and I do not propose to account for these phenomena at present. I only give these experiments as being curious and interesting, as showing the importance of experimental research in such investigations, and also in the hope that what has been said upon the subject may stimulate others to investigate it. The length of this paper, so much beyond what I had intended it to be, I should deem required some apology, if I did not feel that, although for practical purposes this philosophical demonstration is not needed, yet it ill becomes a body claiming to be scientific to rest short of a thorough philosophical and scientific investigation of all processes it may have occasion to use. In conclusion I would state that the experiments with the pure rubber surprised me greatly, but naturally suggested the inquiry in my mind, "If the action of the rubber in driving this bar so nearly approximates in results to the more solid, both elastic and non-elastic materials, why may it not be used to pack the gold as other mallets are?" I made the experiment with it, having, however, little confidence that it would operate successfully for the purpose, and was much astonished to find that apparently it effected the purpose equally as well as other mallets, and in the cases in which I used it, with much less suffering or annoyance to the patient. I only tried it in two cases, and I cannot, of course, say whether it would generally be preferred; but I think it not improbable that

it may prove valuable in certain cases as in lengthy operations, where the teeth are extremely sensitive to malleting with any material.

I propose to carry out these experiments in the future, and hope when they are completed to be able to say something more worthy of the subject.

From the Dental Cosmos.

ADHESIVE GOLD FOIL.

By Louis Jack, D.D.S., Philadelphia, Pa.

There appeared in the February number of the "Dental Cosmos" a very remarkable article. It is entitled, "Adhesive Gold Foil; its Discovery, History and Use," by Amos Westcott, M. D., D.D.S., etc. It will not be a difficult task to show that, in the portion of the article relating to the discovery of adhesive foil, Dr. Westcott has made some serious mistakes in his claim, if he means that it has any connection with the practice of to-day; that he has made important omissions in the history of his subject; and on the use and application of it, he has said so little, that it is difficult to understand how it can be so important a discovery as he maintains it to be.

The character of Dr. Westcott's paper is such that a review of it might be made with considerable profit; but I prefer to confine myself to the endeavor to show that there has been no connection between what he claims to have done about the year 1840, and the important stride which has taken place in the practice of operative dentistry since 1855. It will easily be proven that there is a distinction between the observation of an uncertain and unreliable adhesiveness which gold foil was sometimes found to possess as much as thirty years ago, and that quality of excessive adhesiveness as now regularly furnished for our use, and as now appreciated by very many operators; between the blind observance of a property which, when marked, was then considered by nearly every one a difficulty and a serious imped-

iment, and the intelligent estimation of this valuable property, which soon occasioned it to be turned into an important aid in filling carious teeth, once a clear definition of it had been made, accompanied by methods of using gold foil which were somewhat new.

I shall also make it plain to whom we are to credit the clear recognition of the extent of this property of pure gold, and his estimation of the importance of it, and to whose efforts the dental profession is indebted for having introduced and made public, methods of operating which have, in the hands of so many operators, completely revolutionized the modes of filling teeth which were in general use as late as twenty years ago. It is not out of place that I should attempt to establish the claim of the one I believe to be entitled to whatever credit is connected with the introduction of extra adhesive foil into common use in our specialty. It happened that my associations at the time were such as to cause me to be familiar with the first tangible experiments in this direction, and that I was intimate with all the steps which led to its public announcement. I feel sure it will cause no surprise to the great majority of older practitioners, when I mention that the present methods of using adhesive gold foil will all be carried back for their starting-point to the published statements made by Dr. Robert Arthur, about 1855. Before that time the generally practiced methods of introducing gold while filling teeth, were such as to render inadmissible the use of foil possessing this property in more than a slight degree. Such a degree of adhesiveness, as the bulk of dentists consider a great advantage to-day, would then have been a constant source of complaint, on account of the methods of operating then in vogue. The manner of using gold then, as now, may be divided into two classes, viz.: those where the layers of gold, in being introduced, were allowed or expected to slide upon each other, either in entering the cavity or in the after consolidation; and those where the operator consolidated the particles from the commencement, adding fresh pieces successively to the previously packed, until the carious cavity would be filled. This latter method was practiced by comparatively a very few persons, and only by such could

any advantage be found in much adhesiveness. It could easily be shown that this latter mode did not reach a satisfactory realization, until the character of adhesiveness was clearly made known, and until it was made a controllable quality by dentists; from this moment the latter method has constantly increased, and will continue to do so just so far as an intelligent knowledge of this quality fixes itself in the mind.

Any one who is not blinded by prejudice or wedded to familiar ways not easily parted from, must admit that from the time of the explanation by Dr. Arthur, of the system he worked out for using adhesive gold, published from 1855 to 1857, and his expressed anticipations concerning the valuable results springing from the use of gold possessing this quality in a high degree, that a marked advance has been taking place in the quality of dental operations not previously attainable. It may be difficult for many to realize this, since it is hard for the mind to travel back into its old paths and regard them as any different from the present track. I could make clear, if space would permit, what changes have occurred in the manner of preparing cavities and filling teeth consequent on this improvement, which changes have facilitated the performance of good fillings, as well as at the same time conducing to the better preservation of the teeth.

Now, it so happened, as I have intimated, that I was cognizant of the facts connected with Dr. Arthur's realization of the great importance of the adhesiveness of gold; and these facts, as well as all the steps and methods connected with the subject, were published at that time; of these Dr. Westcott was aware, and yet he failed to take any notice of them in his article. It will be remembered that Dr. A. made haste, as an earnest of his appreciation of the valuable aid he found in his discovery of this property, and of the means to be used to regulate and control this adhesiveness, to publish a full statement of the whole subject. He exhibited to the whole profession how the adhesiveness could be increased and diminished at will; how and when to use it, and when not to accept it.

The circumstances connected with his claim will be found in the "News-Letter," of that period, and in his little treatise on

the subject, published by Jones & White, in 1857. Of these facts Dr. Westcott must have been cognizant; his history of the subject is so far very deficient.

It may not be out of place here to enter into a relation of the mode of Dr. Arthur's independent discovery of this property. In the winter of 1855 I was associated with him in the practice of dentistry in Philadelphia. Dr. A. had been using "sponge gold" almost exclusively for a year previously; and under his direction I had been making experiments as to the relative density of "sponge gold" and gold foil fillings. While packing some foil which had become hard and unmanageable from handling and great age, he recommended me to anneal it, when he at once observed that it adhered in the same way in which the sponge gold did—in fact, that it required the same kind of manipulation. He at once commenced to use it in precisely the same manner as he had been using the sponge gold. Dr. A. quickly recognized the full importance of this, to him, newly-discovered property of gold, and he set to work earnestly, in his usual way, to investigate its character.

Mr. David Morgan, an enterprising and faithful manufacturer of gold foil, became at once interested in Dr. A.'s views; experimented with foil until he was soon able to produce with uniformity a gold of far greater adhesiveness than any which had been previously made. Before this time "sticky" gold was a somewhat accidental thing, the effort of the manufacturers being to overcome as far as they were able every considerable appearance of this quality. Other manufacturers also took the matter up, and now there is hardly any but have a far greater control of their production than they were previously capable of securing.

Quickly following this recognition came the necessity for a modification of the form of the cavity, of the mode of preparing the foil previously to introducing it, and also of the instruments to be used for the purpose. The common methods would not at all answer. This was a new step in dentistry, and the history of our specialty will, when examined, show that it has been one of the most marked advances which has yet been made in it.

The introduction of sponge gold and the instruments necessary to use it, certainly prepared the way for the effective use of adhesive gold; but considerable modification of the latter was necessary for the use of the newly-prepared foil. All the features of the modified manipulations were carefully worked out to a satisfactory conclusion, and the results anticipated were fully realized in practice.

When Dr. A. found he had fallen on a new and valuable track, he lost no time in making known all he had done, in such a way as to be of service to the whole profession; and from the appearance of his two articles referred to, the general use of adhesive foil commenced, and has extended so widely as to be accepted at the present day by almost every good operator in the profession.

From the time referred to, the term "adhesive foil" began to be used, and nowhere will it be found at a date previous to this.

Dr. A. at that time was unaware of the adhesive qualities of gold. He went into an investigation of the matter as an entirely new thing, and from my knowledge of the circumstances, I am confident this was the case. Not only was it new to Dr. A., but it was apparently entirely new to the profession; a strong presumptive evidence of this was the interest which the subject excited at the time, and the opposition which was made in many quarters, as to the advantage to be derived from adhesiveness. It will be remembered that a considerable number denounced it as a dangerous innovation; others maintaining that it was a distinction without a difference. The first have had their answer in the modification of the methods of operating to secure the most perfect results, and the almost general acceptance of the property; the second may be enlightened by comparing what had been written on the subject before 1855 with what has been written since.

It will be remembered by those who know Dr. Arthur and his published statements, that some twenty years ago, he was in the habit of using very heavy numbers of gold, ranging from 30 to 60. The process was one of working up solidly from a starting-point in the cavity, using very sharp points, somewhat as adhesive foil is used to-day; and yet, Dr. Westcott, who, I am as-

sured, was present at the meeting of the American Society when this method was first presented, did not take occasion to mention the application of what he now claims to have discovered long before that time. The use of heavy numbers of foil in this way was one of the steps which caused Dr. A. to use "sponge gold," and afterwards again adhesive foil, around which circle he has completely traveled fully twice to my recollection.

I was a student of the Philadelphia College of Dental Surgery; attended the two first courses of lectures in this institution, and was present at nearly every lecture delivered by Dr. Townsend, to whom Dr. W. refers. He was a man we all know as having been a foremost operator of the time, and who was enthusiastically alert for every improvement, and free in his presentation of every method of any value in that department with which he was so closely identified, and in connection with which he is so widely known. And yet I never heard him give any intimation that he knew anything of "adhesive gold" until it was brought to his attention by Dr. Arthur. He could not have failed to be informed of the possession of any information of great value which was at all attainable. I remember nothing, either in his lectures or from his private conversation, that bore any more than the most remote relation to adhesive foil. I am sure he had no recognition of this quality beyond a certain small degree of adhesiveness, about which there was then no uniformity. In proof of this, he found Dr. A.'s methods and extra adhesiveness a difficulty he, in his established methods of operating, could not overcome. He is remembered to have stated that his brother, Charles Townsend, found the new method especially adapted to labial cavities. These facts are evidences of distinctiveness in both materials and methods.

I will call attention for a moment to the statement of Dr. Westcott, that he discovered this property accidentally about the year 1840. He states that in having a quantity of gold foil sent him by mail, the sheets of gold were found united in consequence of the leaves of paper having been removed, and that he at once accepted the hint that he might purposely take an advantage of this disposition of "sticky" gold, which has

been to him of more or less service ever since. For his prescience in this I give him all credit, and the excellence of his operations all must admit who have become acquainted with them. Others as well as Dr. Westcott have recognized what he called "stickiness" of gold, and it is unquestionably true, that the productions of the better dentists of that time, were due, in a great measure, to this property of the foil used; for, indeed, without adhesiveness in some degree, it were impossible at any time to make good fillings. But I fail to see in these facts any other than a common observation of a quality which, from the failure to fully appreciate it and work it up systematically, may be called a blind observation. Neither can I see any connection between what he claims he did then, and the present methods of using adhesive gold foil. In this connection of the discovery of adhesiveness, a noticeable feature in the matter is, that Dr. W. was one of the leading men in the dental profession, at the period to which he refers. It was a time, it must be remembered, when dentistry was being delivered from the occult condition in which it had been for so long a time; this was the day when the first attempts to liberalize our specialty were made, and when its leading men were emulating each other in making and publishing improvements. The American Dental Society was then established, and the "American Journal of Dental Science" was started; in the former Dr. W. was a prominent and active member; and of the latter he was for a time an editor, and through a considerable period a frequent contributor to its pages. Now, what is remarkable is this, that, at a time when he was vying with others in making public any new views of his own, this great discovery will nowhere be found mentioned. It appears surprising that Dr. W. could have been satisfied with personal conversation simply, concerning such an important discovery, and the more so when the zeal usually shown by him is considered. He could not then have had an inkling of the importance of a property he now claims the discovery of, but for which he had not an intelligent appellation. I have no desire to question anything Dr. Westcott has said as to what he has done, or to detract anything from him which is his due.

But when he attempts to write the history of adhesive gold foil as it has already developed itself, he has but little claim to confidence as a relator of past events unless he gives all the prominent facts connected with it.

It is also remarkable, that while Dr. W. claims the original discovery of adhesiveness, and declares it so great an improvement as would have warranted him in taking out a patent for it, that he does not avail himself of the advantages of this discovery, but uses gold in such a way as to preclude the employment of foil possessing adhesiveness to any considerable degree. From my experience, if I were so limited in its use, I should endeavor to keep silent on the subject. So that it now appears that, after having discovered this valuable property thirty years ago, and having made use of it "more or less ever since," Dr. W. has, after his long silence, written nothing that is of the slightest value to any one who looks to him alone for instruction in the use of adhesive gold. Is it not difficult, therefore, to perceive what credit Dr. Westcott can expect to obtain, for the mere fact of having accidentally discovered that gold had the property of welding in a cold state, although the discovery may have antedated that of any one else, unless he had brought it to the notice of the profession in such manner as to be serviceable to it? The use of adhesive gold has become so familiar to the dental profession at the present day, that the recollection of the disinterested spirit with which it was given to those who are now using it seems well-nigh forgotten. It affords me pleasure, as an act of justice, to recall attention to the real author of the method of using gold foil upon which most operators of to-day rely for their best results in their work.

In concluding it may be stated, that it is a matter of little concern to whom we are indebted for improvements in our specialty, so long as they are well developed and clearly published; by so doing they are rendered beneficial to all. And as the world sees, he who does not act in this manner debars himself from any claim of originality, particularly when he happens to be a member of a liberal profession.

As no idea comes down into the world fully fledged, but may

be found in many places at the same time, scattered as germs, so only to the one who vivifies and develops the thought in an active and tangible way can any credit be given. When any new thing is cultivated in this manner, it is out of place and unfair for any of those who have had hold of a scattered germ, to claim the maternity of the practically developed idea.

And besides, may I question whether it is not a hard thing that, while making a claim for improvements in any direction, any one should ignore those who have been investigating with some advantage and success in the same direction.

GOLD FILLINGS.

Heavy numbers are still used by those who first introduced them in this city. But some who advocated Nos. 60 and 120 have finally settled down, they now think, on No. 30 for all kinds of work.

This is the No. that I have advocated in the JOURNAL for a long time. I use No. 30 for nine-tenths of my work, in heavy foil. No. 60 for finishing surfaces. No. 20 for hand-pressure. No. 2 or 4 for the bulk of many safe *enclosed* cavities.

We have now at the DEPOTS *rolled* gold instead of hammered, of these heavy Nos. I have used the rolled, and it seems to be softer and more easily manipulated. The crystals in this variety are elongated, instead of spread apart. In theory, I should consider a plug stronger made of the rolled, and I would advise good operators to try it and report through the JOURNAL.

I have, also, used a variety made by MR. PACK, of New York, whose advertisement will be found in the JOURNAL. This is said to be gold ribbon shaved off of solid ingots under water. I find it in corrugated ribbons of different widths. It works very finely. It is *soft* and adhesive.

I must make further trials before I can say that it is *superior* to rolled gold. If it is *truly* shaved gold, my theory would be that it is superior to rolled; for in the former case the crystals

would not be *disturbed* as much as in rolled or hammered gold, and would be mostly elongated, in any case. This "Eureka Filling" is worthy of a trial by all good operators.

Experiment is the "order of the day" in gold filling, and we cannot *settle down* on *anything* at present. CHASE.

Mechanical and Miscellaneous Department.

CAST ALUMINUM PLATES.

The casting of aluminum dental plates is no longer a matter of experiment; it has become a verity. Beautiful plates are now being cast from this metal successfully, by several different methods. The principles involved are nearly the same in all of these methods of which we have any knowledge.

All use a porous mold, or what is equivalent, all make use of some means to deoxydize the metal, and all cast it under pressure. Among the many plans proposed for accomplishing the desired end, the one exhibited before the Indiana State Dental Association by Dr. J. W. Hollingsworth, of Mount Vernon, Ind., seems to be the most simple and practical, and to promise the best results. His plan is simply to get up the model plate and teeth, as described in the April No. of the JOURNAL. The case is then put into a flask similar in form to the old rubber flask, except that it has neither bottom nor top, merely a flange around the edge. Before flasking several pins are stuck into the model plate perpendicular to the surface. After the case is flasked and the plaster is set, these pins are withdrawn; thus holes are formed which serve as vents, answering the purpose of a porous sand mold. Attached to the back end of the lower half of the flask, is an iron handle, curved at its extremity. About four inches of this handle, next to the flask, is a hollow tube through which the metal is cast. At the point in the handle at which

the metal is poured in is a small hole, and directly underneath it a lip-like flange upon which to rest the crucible while pouring the metal; from an inch or two above this aperture, the handle is either a tube or half tube with guides across from side to side; passing along the handle beneath the guides is a wire to which is attached a piston which fits nicely the tube at the end of the handle. The whole apparatus is placed in a charcoal fire, and when at nearly a red heat it is removed by means of the handle, and held upright, a small ball of paraffine and wax is dropped into the hole in the handle and allowed to burn out; when this is done the metal is poured in and the piston is forced down upon it by means of the wire in the handle. As the pressure is continued the metal is forced through the openings in the mold, the flow is stopped by chilling the surface of the exuding metal; when all of the openings are full the pressure is discontinued and the case allowed to cool.

Another plan is to put the metal in a closed chamber connected with the flask, and the whole apparatus is then placed in the fire; when sufficiently hot to render the metal fluid or semi-fluid, it is forced into the mold by screw pressure. The most, if not all, of these plans have been patented. We hope soon to give our readers full details of each process. E.

BOOK REVIEW.

The spicy little periodical, the "Dental Office and Laboratory," puts in its regular monthly appearance at our table, filled with things wise and otherwise—muchly otherwise. The July number contains letters from correspondents on the vexed questions of the day among the dental fraternity—rubber, patents, cheap dentistry, &c.—also a long list of queries and answers to correspondents. We have been not a little surprised many times when reading this paper, at the kind of information and instruction it is giving its readers in its replies to correspondents. As a fair specimen of the dental wisdom it is constantly exhibiting,

we copy the following letter and reply from the July number. It speaks for itself:

"*Editors Dental Office and Laboratory:* Some two or three weeks since, in attempting to remove the nerve from the right superior lateral incisor, of a young lady, with a bearded extractor, it became fast, and in attempting to remove it broke it off, leaving about three-quarters of an inch in the tooth. All my efforts at removing it were fruitless, and so I gave up the job, and treated it as I would any other with temporary filling, &c. In five or six days came back, face very much swollen and painful, lanced the gum, upon which a quantity of thick grayish matter was ejected. I would here say that the tooth was slightly ulcered before I commenced working at it. In three or four days saw her again, face a little swollen, but not as sore. Leeched the gum and sent her home, since which it has occasionally swollen a little, but not been painful. What is best to do in such a case, and what will be the consequence of leaving it in, which I am quite sure I shall have to do, it being a bearded instrument?

By answering, you will greatly oblige a

June 13, 1870. SUBSCRIBER.

Yours is one of those perplexing cases from which we will show to you a way of extracting yourself. The barbed drill has nothing to do with subsequent trouble. Make an opening with bur drill through labial surface over the abscess, perforating it externally, and treat through the opening. If the broach does not pass through the foraminen, it will give you no trouble. We thank you for your confidence, and are only too happy when we can relieve a suffering brother dentist."

We would suggest that perhaps it would have been wiser and better to have showed Subscriber a way of *extracting* the bearded extractor, as the plan proposed for *extracting* the dentist is questionable. We suspect that a barbed drill, three-fourths of an inch long, forced into a nerve canal, not usually more than one-half or five-eighths of an inch in length, if allowed to remain there, might be the source of subsequent trouble. We see no propriety in making an opening with a burr drill where an opening already exists. "If the broach does not pass through the *foraminen* (a new word) it will give you no trouble." A valuable piece of information, certainly. How thankful the suffering brother dentist should be for the instruction so generously bestowed. His confidence must certainly be very much increased if the plan proposed extricates him. E.

MAMMOTH AND PROCTOR'S CAVES --- AMERICAN DENTAL ASSOCIATION.

Messrs. Editors: — I take pleasure in announcing to the members of the *American Dental Association*, to be held in August, at Nashville, that I have made arrangements with the proprietors of these Caves, and the hotel at Mammoth Cave, for as many members of the Association as wish to do so, to visit these truly wonderful places at greatly reduced rates. The fare the round trip from Glasgow Junction to the Cave and return, including two days board at the hotel, is eleven dollars. This includes a visit through the long and short route in Mammoth Cave and Proctor's Cave. The regular fare is seventeen dollars. Should the party only wish to go through one route in Mammoth Cave, the fare will be, from the junction to the Cave, including Cave fees, three dollars, and three dollars per day at the hotel. The proprietor has evinced great liberality in reducing the fare to the members and their wives, who may wish to visit these truly wonderful places. The Louisville and Nashville railroad runs within seven miles of the Cave. Persons can stop off and visit the Cave without extra charge on the road. This road takes all members to the meeting at half fare. It is hoped that every member who can, will come and bring his wife.

W. H. Shadoan, D. D. S.,
Member of Committee of Arrangements.

Louisville, Ky.

All papers are requested to copy this.

NOTICE.

At the last annual meeting of the Missouri State Dental College Association the Committee on Publication was ordered to publish in the July number of the "Journal" the names of the stockholders, in tabular form, showing the amount of stock taken by each, and the amount paid on each share to date. It was also ordered that a call for one dollar on each share be made

to pay a small balance due for work done on the "Journal." It has been thought best to defer this publication till the August number, to give the stockholders an opportunity to respond to this last call.

H. E. Peebles,
Isaiah Forbes,
C. W. Spalding,
Committee of Publication.

New York, June 22d, 1870.

Homer Judd, Esq., M. D., — My Dear Sir:

The Erie Railroad Company has agreed to sell tickets to those wishing to attend the American Dental Association at Nashville, for half fare, that is $34 for a ticket from New York to Nashville and return, good for thirty days.

All living in New England, or near New York, at any point, can obtain tickets at this rate by sending money orders for the amount named, to J. F. Phelps, Ticket Agent of the Erie Railroad, No. 957 Broadway, New York City.

E. A. Bogue,
Chairman of Railroad Committee.

The Michigan Central Railroad will issue tickets to Nashville and return, from Chicago, at one-half fare, good for four days after the adjournment of the Association.

Geo. H. Cushing.

The Iron Mountain Railroad will give round trip tickets from St. Louis to Nashville and return for $17 00.

Judd.

The Missouri Dental Journal.

A MONTHLY RECORD OF THE SCIENCE.

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From the Boston Journal of Chemistry.

FORCE, THE EQUIVALENT OF MATERIAL MOTION.

By DR. J. E. HENDRICKS, Des Moines, Iowa.

That the chemical molecules of all substances have a definite and determinable motion which is the source of all that form of force which we call heat, is sufficiently evident from the law of *Petit* and *Dulong*, which, when the necessary eliminations are made, may be regarded as rigorously exact, and is therefore accepted as the basis of a mechanical theory of heat; the law may be announced as follows:—

The specific heat of all substances multiplied by their respective atomic weights is a constant quantity.

If we accept the sensation of heat as the manifestation of otherwise inappreciable molecular motions, it is not difficult to form a rational conception of it as a form of force readily convertible into sensible motion, or mechanical force. And as, through the agency of the steam engine, heat is now employed as the principal motive force throughout the civilized world, and, moreover, as heat and light are the motive forces from which result all, or nearly all, natural phenomena which come under our observation, including the growth and decay of vegetable and animal organizations, it is interesting to trace the material motion of which they are the indications, through the whole, or even through a part of its cycle of changes.

It would obviously be absurd to attempt to assign a rational

cause for the origin of matter; and in like manner it would be absurd to attempt to assign a cause for the initiation of motion. We accept the existence of both matter and motion as a primal fact, and cannot imagine as possible either their coming into existence or their going out of existence. Visible matter may, and frequently does, escape ordinary observation, and may yet be proven to be present and undiminished in quantity; and in like manner sensible motion may disappear and yet, from the principle of the conservation of forces, we know that it continues undiminished in quantity.

The essential characteristic of matter is inertia, and its universal condition is motion. It follows from the conservation of forces that the same amount of motion that now exists in the universe, always existed, and always will exist. Contiguous portions of matter may be *relatively* either in motion or at rest, yet the sum-total of motion is, and forever must be, invariably the same.

The recognition of a universal non-gravitating ether which is capable, as the luminiferous ether is known to be, of imparting motion to, and of receiving motion from, the molecules of ponderable matter, enables us to comprehend the *apparent* annihilation of motion, and to understand that what appears to be destruction of motion is only a transfer from a tangible form to an intangible form of matter.

When, for instance, the atmosphere radiates its heat into space, the motion which constitutes the heat is not destroyed or lost, but is transferred to the universal ether in space; and as the tension of this universal ether is so great that a wave is transmitted through it with a velocity of two hundred thousand miles per second, it is obvious that no amount of local radiation to it can sensibly affect the amount of motion, in even a limited portion of the ether, for any considerable period of time.

Not only is the ether which pervades infinite space eternally in motion, but the molecules which constitute every form of tangible matter, as we have already remarked, are proven to be in constant and rapid motion among themselves, each substance having molecular motion peculiar to itself. Two substances having dissimilar molecular motions may therefore be brought in

contact so that their molecular motions shall *interfere*, and a compound molecule will result, the motion of which will be *less* than the sum of the motions of its constituents. This difference of motion is not so much motion *destroyed*, but it is so much motion *transferred* to the surrounding medium, and manifests itself in the form of heat in contiguous bodies. And this heat, if developed in a suitable body, as in aqueous vapor, for instance, or in any permanent gas, may, through the agency of the steam engine, be converted into mechanical force; or, through the agency of vegetable or animal organizations, into the vital forces.

All forms of force, therefore, or at least the mechanical and vital forces, result from molecular motion, and are the equivalents of the inertia of the molecules multiplied into their velocities.

From the Druggists' Circular & Chemical Gazette.

ON NUTRITION,

WITH ESPECIAL REFERENCE TO THE IMPORTANCE OF THE PHOSPHATES.

By Dr. A. Ott.

Since the organism is not endowed with the faculty of converting or creating matter, it is evident that all the parts that are being lost or rendered effete (whether they be fluids or solids), must be replaced not only in regard to quantity, but also as to their original properties. Nutriment or food is every substance which is capable of restoring to the mother liquid of the body — the blood — one or more of its essential constituents. Yet, among various nutriments — provided they be all equally digestible — the greatest well-being of the organism will only be secured by those that correspond most with the constituents of the blood. As to the composition of this fluid, which Goethe in his "Faust" quite appropriately terms, "a most peculiar sap," it is a comparatively simple mixture of water, albumen, various mineral salts, fat and sugar. These substances may be classified into four groups, to-wit: 1. Albuminous, or plastic substances. 2. Fats. 3. Carbo-hydrates. 4. Inorganic substances.

In regard to the substrata of the first class, they play a no less important part in the life of plants than in that of animals—there being in fact no living cell without them. They prevail in general in animal food, but the grains of cereals and leguminous seeds are also rich in them. They are principally employed in the reproduction of the tissues and of the actual organs of the organism.

The substrata of the second group, the fats, appear to be of no less great aid in the formation of cells and tissues; moreover, they mainly contribute to the production and maintenance of animal heat. Fat is of great utility in filling up the interstices between muscles and bones, vessels and nerves. Being a bad conductor of heat, it is most useful for the protection of the animal body from the injurious effects of rapid alterations of temperature. "Fats take an active share in the process of digestion, and preside generally over all the processes by which the fluid nutrient substances are converted into the solid substrata of the organs."—(Lehman.) In regard to their occurrence, they are not only met with in the animal world, but also in vegetables, especially in the seeds and kernels of fruits.

The substrata of the third group, to which belong oleaginous fats, starch, sugar, pectin, and bassorin, stand in intimate relation to those of the former group, one of their principal offices being the maintenance of animal heat. Moreover, they control an important function in the intestinal canal, which consists in abstracting part of the bases from the phosphates, appropriated with the vegetable food, in order to convert them into acid salts. They are capable of being changed into fats; and one of them, the sugar, certainly contributes its share to the solution of the carbonate and phosphate of lime in the alkaline fluid of the blood.

In regard to the inorganic salts, they are not less essential than the substances of the foregoing group. Experiments instituted by French investigators have proved that animals starved in more or less brief periods of time when fed upon substances containing no mineral salts, although otherwise nutritious. We also learn from other experiments, that a certain group of these

bodies contributes essentially towards the nutrient power of the different articles of food. Among them we shall have occasion to dwell especially upon the functions of the phosphates, of which C. Schmidt has shown that they are required to supply the first basis for a new tissue, even in the case of those organs which subsequently exhibit an excess of carbonate of lime. And it is certainly significant, that they take an important share in the formation of protein-bodies, for they occur in all those vegetable bodies which are rich in albuminates.

Moleschott has calculated the mean daily quantity of food necessary for an adult individual; it consists of

Albuminous substances,	1,950	grains.
Fatty Bodies,	1,250	"
Saccharine matter,	6,060	"
Mineral Salts,	450	"
Water,	42,000	"
	51,710	"

The opinion has long prevailed that one of this class of substances was more important than another in the maintenance of the vital forces, but this opinion is now sufficiently disproved. However one class may distinguish itself in the restoration of vital organs, life itself will cease to continue in more or less brief periods of time, when they are employed as exclusive articles of food. The nutrient quality of any one substance is therefore entirely relative — or in other words, all four groups of nutrient substances are equally necessary to supply materials for the establishment of new manifestations of force; and it is the principal end of physiological chemistry to show what are the most favorable proportions of the nutrient matters mentioned for the fulfilment of the functions of the organism in health and disease. In judging of the nutritive value of food, we must not lose sight of its digestibility. Among two articles of food one may possess more nutritive value than the other, although, perhaps, less abounding in one class of nutrient ingredients, for the simple reason that it is more digestible. Oysters, for instance, contain less nutrient matter than the flesh of fish; still they are more nutritive. This is also the case with the

flesh of young animals, as compared with that of old ones. The same relation exists between leavened and unleavened bread, although both contain the same amount of nutrient matter. The latter is far less digestible, serving only to overburden the stomach and to induce indisposition.

Without entering further into the study of the process of nutrition, which, according to Lehman, is indeed the final aim of all researches in physiological chemistry, we shall at once proceed to take a view on the importance of the phosphates. Among all the acids known to us, there is none which is capable of entering into combination with so many bodies as phosphoric acid. Beside with the mineral bases, it will form compounds with starch, and even other acids, water, glycerine, and fats. Phosphate of lime is present in every tissue; moreover, all secretions from the blood, which are distinguished by their plasticity, exhibit phosphates. The solid frame-work which supports the soft parts of the body owes its solidity to phosphate of lime; and the brain, spinal cord, and nerves abound in various compounds of fats containing phosphoric acids and phosphates. Indeed, there is no other substance which is so especially attracted and retained by the tissues of the animal body.

"One striking difference," says Prof. Horsford, "between vegetable and animal life, is in the increase in the proportion of phosphates in the latter over the former. Indeed, the higher the organization the larger the proportion of this ingredient and its compounds. It is essential, however, to the germ of the humblest. Pasteur found, that without phosphoric acid the simplest forms of vegetable and animal life failed to be developed, however otherwise favorable the circumstances might be."

In regard to the brain, it has been ascertained by Borsarelli, that among all organs of the body it contains, by far, the largest amount of phosphated fat, the amount of phosphorus being twice as large as that of the muscles. From a very large number of analyses, Von Bibra draws the conclusion, that the brains of higher animals contain more fat, and therefore more phosphorus (which, as we have stated, is combined with the brain-fats), than the brains of lower animals. In the fœtus and

newly born infant the brain-fats exist in considerable smaller proportion than in the adult individual; the amount of water in the brain of the child is, on the other hand, very large. In the brain of the child more fat is found than in the fœtus, the quantity of fat increasing quite rapidly with age. The brains of animals that are left to starve retain their fat, while other organs are soon deprived of it; which seems to show that the mental functions necessarily require a certain amount of phosphated fat. We are far from asserting that there is any special connection between the intelligence and the amount of phosphorus in the brain, but it appears certain that without phosphorus there is no thought; just as well as the blood is unable to fulfil its mission without iron, or the skeleton without a sufficient amount of lime. Does any one consider the intellect to be lowered because it manifests itself in matter? If so, must not the light emanating from a flame appear less cheering because it is dependent upon the material process of combustion, or sound less agreeable because it is allied to etherial undulations?

Without dwelling any further upon the importance of the phosphates, let me answer the question, How can we best procure them? The great stores of the phosphates are the grains of cereals. They are contained in the so-called gluten coat, which, like a row of beads, lies between the outer or true bran, and the interior mass of starch-cells.

With the present system of grinding, we obtain under the most favorable circumstances only seventy-five per cent. of flour, instead of ninety-four; nineteen per cent., consisting chiefly of gluten and phosphates, being removed by bolting. The objects of this practice are two-fold; first, to separate the ferments lodged in the bran, so that it is possible to keep the flour for a considerable time without its becoming sour; second, to render it white, so that it will produce bread agreeable to the eye.

To Prof. Horsford, of Cambridge, Mass., we are indebted for a method by which the nutritive salts that are lost in bolting are restored to the flour. The same consists in the use of a baking powder composed of two preparations in the form of powder,—an acid and an alkali; one contains phosphoric acid

in combination with lime and magnesia, the other bicarbonate of soda. In using them, certain quantities of each are measured with a small tin measure and intimately mixed with the flour; to this mixture the required quantity of water is added, and worked into a loaf of dough, and without much delay placed in an oven. As regards the chemistry of the process, it is readily understood. When the two powders are mixed with the flour, there occurs in the process of working the dough a double decomposition; the phosphoric acid unites with the soda and drives out the carbonic acid, which puffs up the dough, and by baking secures a bread of the desired vesicular structure.

The bread prepared by the aid of this baking powder is of an excellent taste; it retains its moisture much longer than equally porous fermented bread does. It may be eaten warm with impunity, while with most persons it is important that fermented bread should lose its freshness, or become stale, in order to the removal of some objectionable qualities, before it may be eaten with safety.

This method of leavening bread has met with the highest praises, both in this country and in Europe. Among the endorsements which Prof. Horsford has received, the weightiest is perhaps that of Baron von Liebig, to whom the world is more indebted than to any living scientific man, and who has given great attention to this subject. In a letter to the inventor, he expresses himself thus: "I consider this one of the most useful gifts which science has made to mankind. It is certain that the nutritive value of flour will be increased ten per cent. by your phosphatic bread preparation, and the result is precisely the same as if the fertility of our wheat-fields had b en increased by that amount. What a wonderful result is this!"

Before closing let me call attention to another phosphatic preparation of Prof. Horsford, which under the name of "acid phosphate," has lately come extensively into use.

"It has been noticed for several years past that a form of liquid acid phosphate, employed as a constituent in the preparation of Horsford's phosphatic bread preparation, was used by the workmen and their families as a medicinal agent. Through

accident or curiosity at first, and afterwards from its observed effects they had been led to use it to such an extent, that it was conceived to be a specific in certain forms of dyspepsia, in wakefulness, and in certain affections of the bladder or kidneys. Physicians in the neighborhood, acting under these intimations prescribed the acid phosphate liquor with marked success. Their example has been followed by others in larger practice and in other localities, with such remarkable results, that, in view of the demand which has arisen, the whole subject has received a careful investigation in the light of the most recent physiological researches, and a strength, and special and constant composition given to the fluid, which will enable the physician to see at a glance the precise quantitative relations of the most important ingredients in a given volume of liquid."

"So far as experience goes, it seems to act as if it were nutriment to the cerebral and nervous systems, restoring to their normal action secretory organs that have been deranged, giving vigor where there has been debility, and renewed strength where there has been exhaustion."

"It has been found especially serviceable in dyspepsia and disorders incident thereto; in urinary difficulties, proceeding from paralysis of the bladder or sphincter, and is known to be useful in tendencies to gravel and spermatorrhœa, in cerebral and spinal paralysis, mental exhaustion, wakefulness, hysteria, and other nervous affections."

From the Philadelphia Dental Times.

ASSOCIATION AS AN ELEMENT OF IMPROVEMENT.

An Address delivered by Samuel Welchens, D. D. S., before the citizens of Pittsburg. Published by request of State Dental Society of Penn.

In no age of the world has there been so much attention paid to the formation of associations for mutual benefit and improvement as the present.

History is so blurred and blotted with the iron rule of despotism, that the very instincts of man lead him to prefer habits of

isolation and selfishness, rather as a medium of protection from the persecutions and inhumanities of the rulers, in those earlier days, than to claim the benefits of society where so much jealousy and oppression seemed to be the controlling element, and where the social attributes of the home circle, in many instances, proved to be a certain passport to the block, or the torture-rack of the Inquisition.

The tyranny of public sentiment, the dark designing prerogatives of government, and the superstitions and cruel infatuations of the Church, have each, in turn, so emulated one another, in deeds of cruelty and oppression, that the individual in those days must have been bold, indeed, to have so far disregarded the principles and tendencies of either, as even to contemplate a movement towards fraternal intercourse within their borders.

There is, perhaps, no better settled principle in history than the quickening, jostling, progressive energy awakened by those *associations;* and this alone, when the very outposts of despotism rested essentially upon the ignorance of the people, was enough to call down upon the very idea of such improvement the anathemas and oppression of institutions which could not live a moment, except upon the scattered fragments of society and the bonds of ignorance and superstition.

Association, unity and harmony, have ever proved a most formidable bulwark to civil and religious liberty, and that expansive development of scientific and intellectual improvement, which has raised the world from heathenish darkness into the broad, open sunlight of progressive development.

Powers and principalities, therefore, as well as the moral and intellectual status of society, are alike influenced by this balancing and improving element. The asperities and anarchies in governments rarely disturb the evil purposes of the despot; but the *association* of his subjects for improvement and culture strips him of his regal robes, and makes him tremble on his throne.

The very occasion which gathers a people together gives character and expression to their actions, but the achievements and results of their councils gain strength and power in proportion to the energy they exercise in their deliberations. Patriotic hearts,

assembled to solemnize the day on which their freedom was announced, are bound together in mutual sympathy, and with heads erect in the proud consciousness of equal rights, the air swells with the loud acclaim of their joyous voices, as they repeat, in stirring accents, the immutable truth that man was born to be free. But it is in their *associated sympathy* that the compact is sealed, and that the transaction is characterized with the forces and powers of perpetuity.

All this accords well with "the eternal fitness of things," for there is a law in the economy of nature which subordinates every species of growth and improvement to the element of dependency.

No principle is more palpable, and no power more effective in its complete conformity to that rule of life that makes one object active and energetic, and another slothful and negative. It runs through all the relations of nature with a talismanic influence, and harmonizes all discrepancies, smooths all disparities, and gives an earnest, positive, progressive energy to every interest, whether utilitarian, scientific, civil or religious.

Association consolidates, establishes, renovates, sharpens, sustains and develops every business enterprise, pursuit or profession, and every scheme of a moral or religious character that seeks its stimulating and renovating power. With it, the race of mankind is at once raised to dignity and prosperity; without it, selfishness, discord and anarchy rend asunder the proud fabric of human enterprise, and as the planets of the solar system, deprived of the forces which keep them in their respective orbits, would break away into wandering meteors, so would the social system crumble into withering fragments, and fly off into isolated selfish particles, as scintillations are emitted from the consuming metal. It is to the intellectual world what the law of gravitation is to the physical, and no other instrumentality can so develop the finer and higher qualities of the mind, as the comparison and interchanging of views and ideas. "As steel sharpeneth steel, so the countenance of man sharpeneth that of his brother."

If we analyze the fertilizing influence of the spirit of those

associations, and contrast its virtues with the sordid elements of abstract individualism, we will see at once how largely it enters into all the relations of life, and how happily its results compare with the repellent characteristics of selfishness.

In a scientific point of view this law of dependency or association is of paramount significance. Chemistry, electricity, the laws of gravitation and cohesion, the conditions of growth in vegetation, and all the laws of affinity, by which separate and distinct elements are brought together to form systems and construct fabrics, rest essentially upon it.

A chemical compound, for instance, is composed of two or more elements, and as such it is capable of acting in itself as an element in many of its combinations. But without the association of those elements there could be no chemical change or equivalents, and the science would fall as a dead letter by reason of its incompetency.

[*To be continued.*]

ALVEOLAR ABSCESS.

[*Continued.*]

If we see the case soon after the inflammatory action be commenced, and can succeed in removing the cause, the inflammation will often subside without further treatment. This will often occur in cases where it depends upon the confined irritating products of a decomposing pulp of a tooth; an opening for the escape of the irritating gases relieving the pain almost instantly, and the soreness and swelling will usually then soon disappear.

But suppose the irritation has been set on foot by atmospherical changes, or the common causes of inflammation, and the formation of an abscess is threatened at the apex of a root of a tooth. This most frequently occurs where the pulp of the tooth is dead, the diminished vitality of the tooth resulting therefrom doubtless acting as a predisposing cause of disease. We shall have here a sense of uneasiness, or perhaps a dull pain. The tooth seems to project a little too far from its socket, whilst

pressure upon it relieves for the moment the uneasiness, but it soon returns with greater violence. We know that there is congestion of the vessels, and that there will soon be stagnation of the blood.

If we can relieve the congestion at this stage we shall in a great many instances cure the disease by so doing, the cause which produced it having probably already spent its force. Cold suddenly applied seems to effect this more certainly than any other agent yet discovered. Its first effect being to contract the dilated vessels, the blood is forced onward into the veins beyond the affected part, and the congestion having been once relieved the vessels resume their normal size, and take on their normal action. We must bear in mind that in this condition which we are now considering there is a want of tone in the muscular elements of the vascular walls, and that depends either upon a certain degree of exhaustion of the muscular fibres, or upon a want of nervous influence supplied by the nervi vasorum. It is not, therefore, certain whether a part of the effect observed is not due to its tonic or stimulating effect upon the nerves of the part, thus supplying to some extent the conditions required for a subsequent healthy action.

With this view of the case the treatment is philosophical, and the experience of the last few years has abundantly demonstrated its utility. If the diagnosis of the *stage* of the disease is correct, and we are satisfied that there is no persistent exciting cause still acting, we can predicate with a good degree of certainty the most favorable and happy results.

The pain is almost immediately relieved, and the uneasiness, consequent principally upon the swelling of the periosteal investing membrane and elevation of the tooth in its socket, soon disappears. It is sometimes necessary to repeat the application two or three times, but in many cases a single application suffices to bring about a complete resolution of the inflammatory action, and that in a very brief period of time. In relation to the method of using the spray for its local effect upon incipient abscess, we must bear in mind that if the spray is directed entirely upon the soft parts its effects will not be as marked as

when the spray is principally directed upon the tooth itself. It will usually require only two or three minutes to chill a tooth and the surrounding parts sufficiently, and some care is necessary in order to avoid the *freezing* which we hear so much about in relation with this process, as the parts should never be frozen; in some cases where this has occurred very unpleasant results have followed.

It is easy to determine, after a little experience, when the spraying has been carried far enough, for when the mucous membranes are bleached white it will not be prudent to continue the spray much longer upon the whitened parts, but change to the tooth, or to some other place upon the gums near the forming abscess. In a few cases a severe smarting pain has been complained of after the application of the spray, but in all such cases that have fallen under our observation filling the mouth with cold water has proved an effectual remedy. If the general system sympathizes strongly with the local affection, and we have inflammatory febrile action, it will be necessary to make use of constitutional remedies. Rest, attention to diet, with the administration of cathartics, pediluvia for their revulsive effect, &c., will assist in curing the disease.

Operative and Surgical Dentistry.

TIN FOIL.

(*To Students.*)

There is too much amalgam used. The great majority of dentists who use amalgam at all, use the latter and gold exclusively. Tin foil is neglected. This is wrong. Tin foil will preserve a tooth from decay far more effectually than amalgam, as a rule. Tin foil should be used in all cavities that will not cause the plug to be abraded by mastication. It is peculiarly

adapted to approximal cavities, to those on the buccal and labial surfaces also. A tin foil plug is nearly as enduring in these locations as one of gold. In former years, in a country practice, I used tin foil extensively, and found it always more satisfactory than amalgam.

I have seen tin foil plugs forty years old still protecting the teeth.

Why is it, then, that the majority of dentists at the present time ignore the benefits of tin foil? Answer: Because it is *less trouble* to use amalgam!

Young men, this is not right. You think you can earn more money in the same length of time by using amalgam; or your preceptor has told you that amalgam is as good as tin foil, or better. Not true. If he thinks so, let him write an article for the "Journal" in its defense. You should do as well by your patients as possible.

Put in a tin foil plug as it ought to be, and you will not see it turning dark around the margins in one, two or three years, or even a dozen years.

It protects the margins of the cavity as perfectly as gold, as far as the metal extends. If it wears away from the enamel margin, of course that substance is unprotected. A gold plug is better than tin, because it is not affected by attrition as much as the latter.

Not one dentist in ten who has come into the profession within the last ten years knows how to make a tin foil plug; and only a few of the older ones know how to make a *good* one.

You can't make it as you do with adhesive gold pellets. No; you must adopt the *cylinder plan*. And the sooner you learn this plan, both with gold and tin foil, the better for you and your patients.

Tin foil will not *weld* like gold. If you use pellets, they will adhere but slightly to each other; and although you can make an apparently good plug this way, yet it will soon begin to tumble out, piecemeal, to your own discredit and your patient's injury.

CHASE.

ROLLED GOLD FOR FILLING TEETH.

DR. CHASE:

Dear Sir—You ask good operators to try "rolled" gold, and report through the journals. Believing myself called on, I cheerfully respond.

I presume likely that I am the first man that ever attempted to roll gold for filling teeth. When at Saratoga, last August, at the A. D. A., and saw some of the heavy gold, and at the office of our old friend, Dr. Atkinson (isn't it funny that we all center on him when we refer to anything new?) I saw him use No. 30 gold. I then told him and Dr. Taft that I believed that I could make good gold on my plate mill. I came home, and soon afterwards I took some scraps of foil from my scrap-box, melted them on a piece of charcoal, and rolled down to No. 60. I tried it, and found it to work to my satisfaction. Since then I have rolled No. 80 and 120; never anything below 60. When at the meeting of the Mississippi Valley Association, in March last, I told several of my experiments; and at New Orleans, in April, I demonstrated the use of No. 80 rolled gold for filling. I do not use heavy gold to the extent that some do; but I assure you that I can make a better filling with 80 to 120 in particular cases than I can with lighter foil.

I do not believe that some teeth can be saved any better with heavy foil than with lighter foil. I have been constantly experimenting with the various thicknesses of foil ever since I commenced the "Treatise on Filling Teeth." My own preference is for Nos. 3, 4, 20, 30, 60 and 120. A very wide range, indeed. For all large cavities of easy access I prefer the heavy foil, and for finishing in many cases. For small cavities, of difficult access, then the lighter numbers are most desirable. I cannot operate so rapidly with heavy foil as with light. The heavy foil requires more force to condense it than the light, the assertions of others to the contrary notwithstanding, unless they use very fine points; in that event the progress is very much retarded. My preference for fine (what we call fancy) operations in the

molar teeth is Nos. 60, 80 and 120 foil, and an ivory mallet of two to two and a half ounces weight, or a wooden-leaden mallet of four ounces. I have been using the wood, with the inside of lead, such as Dr. Butler advertises, for nearly a year. (I am free to say that I never had heard of such a thing for months afterwards.) Either is a good mallet. I use for very loose teeth an ivory mallet, of one and a half ounces weight. Most patients prefer it to the others. I seldom use hand pressure at all, and never on gold above No. 4. I prefer the mallet in all cases where the case can be reached with that kind of pressure.

W. H. Shadoan, D. D. S.

CYLINDER FILLINGS.

Country practitioners have large demands upon them for *cheap* fillings; they respond by using amalgam, when they ought to use tin foil.

As there are thousands of dentists who never used a cylinder, I wish to say a few words about cylinder fillings, especially for the benefit of young practitioners and students.

Let me make a Tin Cylinder. I take a sheet of tin foil, cut it in two; fold it several times the long way, until a ribbon is formed a quarter of an inch wide. Wind this around a smooth square sided nerve broach, until the ribbon is half used up. I tear or cut off the ribbon. Remove the tin foil from the broach carefully and I have a cylinder. The layers of foil are in close adaptation, excepting the small hole through the center, made by the broach.

These cylinders can be made as long or short as one pleases, and of such a diameter as one finds most convenient for the particular case. It will be found that a large amount of foil is present in a small compass, in the cylinder condition. Yet it is in a compressible shape, if force is exerted upon it laterally and not endwise. The former is always the mode in which cylinders are condensed in a cavity.

From six to twenty cylinders should be used in filling a cavity. Their size should vary according to that of the latter.

They should be long enough to reach from the bottom of the cavity to the top, and project beyond the latter about one-fourth of their length, or thereabouts, depending on the case. They should project so as to give an overflowing cavity, the excess being malleted down as much as desirable, after the foil is *all* put in.

If, however, a cavity is so located that we cannot have as free access to every part of the surface of its plug after the cylinders are *all* placed, as before, then it is better to secure the feet of the cylinders so that they will not move, after having placed two or three in position, and then condense their ends.

If one becomes displaced after being condensed it should be removed and discarded, for the probabilities are that it would not *fit* as before, if put back.

False cylinders are sometimes made by winding a leaf of foil into rope, thus: take a half sheet of tin foil, fold it loosely, and twist it into rope, making the rope tight and pretty solid. Now, cut it to such lengths as you desire, the same as for true cylinders.

These false cylinders are more compressible than the true ones, but do not contain as much metal in the same compass. They are, however, very useful, and I seldom make a cylinder plug without making use of one or more of them. If placed in the cavity *first* they are not so likely to move on the introduction of others, as the more solid ones.

Cylinders make the best possible foundation for approximal plugs near the gum.

Let me now plug the most simple cavity with tin cylinders. It is a good sized cavity in the grinding surface of the first right under molar.

Take up with plyers a false cylinder having nearly as great a diameter as the transverse diameter of the cavity, and a length one-fourth greater than the depth of the cavity. Place the latter with one end resting on the bottom of the cavity, and the other end projecting beyond its margin. With a broad flat instrument, moderately compress the cylinder laterally, its whole length; place another cylinder by the side of this, having a diameter somewhat greater than the space into which it is to be forced. With a long foot instrument, compress both of these

cylinders, and mallet them well home. Continue this process, using *true* cylinders instead of false ones, or mixing them to suit your convenience, until you find it inconvenient to place the end of the cylinder on the floor of the cavity and condense it. When this stage is reached take a pellet and mallet down to the floor, so as to make the depth of the remaining portion of the cavity less. Fill it about half way up. Now, use shorter and smaller cylinders until the cavity is full. The last one which is placed in contact with the dentos should fit loosely, and should be a true cylinder. With a sharp instrument force an opening between the last cylinder and the former ones, and *not* between the last cylinder and the dentos. This opening is to be filled with a false cylinder or a pellet, and well malleted.

Go over the whole surface, now, with the plugger and mallet. A larger condensing plugger at first, and then a smaller one. Cut down the surface with burrs or scrapers, very nearly to the line of rest. Mallet again with smooth or shallow serrated condensers, and afterwards burr and scrape entirely down to the line of rest; polish with pumice stone and chalk. With slight modifications this method will fill any other cavity with tin cylinders.

In the use of gold cylinders I *always* fill the opening with *adhesive pellets*. I use *unannealed* gold for cylinders, though sometimes an *adhesive* gold cylinder is employed for a special purpose, viz: to form a bed for adhesive pellets. CHASE.

Mechanical and Miscellaneous Department.

From the Philadelphia Dental Times.

MECHANICAL DENTISTRY.

By J G. TEMPLETON, D.D.S. Published by request of the State Dental Society of Penna.

The restoration of the organs of mastication by artificial means comprises by far the greater part of the art implied under the term of "mechanical dentistry," which we have chosen as the subject of a few remarks, in the form of an essay, that may

serve as the beginning of a discussion upon a subject forming an important part of our specialty — though much neglected at the present time by many of the best minds in the profession, the consequence of which is, that one particular branch of the science of dentistry has outstripped all the rest in the scale of advancement, while that under consideration has been left, for the most part, to be performed by unskillful and unscrupulous pretenders, calling themselves dentists, who, in some parts of our country, are so esteemed by the public, and considered equal to the best men in the dental profession, which is the direct result of a want of knowledge on the part of the masses of the people as to the proper qualifications of a dentist; hence the mountebank finds a ready market for his stock in trade.

In order to change this state of things, we must not only educate the public mind in regard to the training necessary for the dentist, but we must give to mechanical dentistry that attention which its importance demands, and not allow the wishes or opinions of our patrons to intimidate us from recommending those materials to which the quack is a stranger, and the proper manipulation of which cannot be learned in a few days.

In the discussion of this subject we shall confine our remarks to the objects to be gained in the insertion of an artificial denture, and the means of its accomplishment; and next, the merits of the different materials that are or have been used as a base for artificial teeth.

And, first, the object to be gained other than the mere insertion of an artificial denture, so that it shall suffice the purposes of mastication and articulation, should be the restoration of the features, as near as possible, to that natural expression of countenance of which the patient has been deprived by the loss of the natural organs, and the absorption of the alveoli.

To successfully perform this very important part of mechanical dentistry, the face of each patient must be studied with greater precision than is required of the portrait painter, whose only object is to produce a picture of the face as it is, while the dentist must and is expected to reproduce the face to its original contour, which requires more ingenuity than that exerted by the

photographer, who merely catches the shadow of a face, prints it upon paper, and *he* is called an *artist.*

The artistic reproduction of the desired natural expression is effected by moulding a wax plate upon the plaster model, and trimming so that it shall fill up sunken parts when placed in the mouth, when the expression of the countenance is to be noted, as also the proper length of the teeth required; and if, after thus experimenting, any change is deemed advisable, it can readily be made upon the wax plate, and the effect observed on replacing the wax in the mouth; then, if satisfactory, the bite is taken on the wax plate, from which models are made, on which to arrange and antagonize the teeth in such a manner that they shall correspond in contour to the wax plate.

Having proceeded thus far, the next consideration is what materials are best adapted to our purpose; then, if the case is a partial set of teeth, we would use a gold plate, upon which we would mount block teeth carved expressly for the case, though in such cases we can usually accomplish all the restoration necessary by using the single teeth, such as are furnished by the manufacturers; and here we take occasion to say, that in no case would we recommend any other material than gold for a partial set; and if our patient was not willing or able to pay for the gold, then would advise the use of a plate of pure silver, alloyed with platinum, as the next best material.

Our reasons for advising these materials for all partial cases are, that they possess greater strength and occupy so much less space in the mouth, and also afford a much better return for the money expended by the patient, being more durable than the so-called cheap materials much used at the present time.

Again, we will suppose that our case is a full set, to be inserted on a gold plate; then the necessary amount of restoration cannot always be effected by using the common, plain or single gum teeth. Such cases are often most beautifully supplied with blocks carved especially for the case, and soldered to the plate, the artistic effect thus being at the will of the operator.

While gold as a base is admirably adapted to the purposes of the artistic or mechanical dentist, yet we cannot award to it the

highest place as a base for full upper or under sets of teeth — "the want of cleanliness being a serious objection to its use, which is only imperfectly overcome in the combination of gold and hard rubber.

In "Allen's Continuous Gum Work" we find our ideal almost perfectly attained by its use. A very complete restoration of form and substance can be accomplished, as the porcelain body and enamel can be built upon the platinum plate to any desired shape or degree of fullness; we also get rid of that stiff, regular, artificial appearance of the teeth, as they can be arranged in any position which the taste or judgment of the operator may suggest, to secure a pleasing expression.

While speaking of continuous gum work, it is with pleasure that we recommend to your favorable notice a modification of the same, by Dr. Moffit, of Harrisburg, Pa., which he offers to the profession under the name of the "Non-sectional Block Work," and free of charge to all who will use it — a degree of magnanimity not usual among inventors of the present day and generation.

In many parts of the country the porcelain or mineral base is still growing in favor; for strength, beauty and cleanliness it is not surpassed by any class of work yet introduced to the profession. The natural expression of the mouth, as well as the contour of the face, can be restored by it, as well as with continuous gum work, so justly popular; and, unlike the latter, it can be ground away, if it should be found too full in any place after it is baked, and afterward covered with a coating of gum, that will fuse at a lower heat than the gum previously used.

As a general rule an upper set can be ground to a cast of the mouth in about the same time that will be required to grind a set of blocks for rubber work. When it comes from the furnace it is ready for the mouth, except the grinding; therefore there is no filing, stoning or lathe work required to finish it.

We have been situated where we could observe the success of this class of dentures for the last twelve years, and think (though in most cases in the hands of incompetent men) it has given good satisfaction to their patients. Being a good conductor of caloric,

the mouth keeps as cool and healthy as with gold or continuous gum work, and it is not as heavy as either.

The next and last material which we would recommend for the purposes of restoration, is vulcanized rubber. The ease with which it can be manipulated to obtain the desired result constitutes, in our opinion, the only reason why it should be used; which, in connection with the low price at which it can be obtained, and at which it is served out to the public at large by the many would-be and so-called dentists of the present day — themselves the creature of its introduction — constitutes the main reason for its almost universal adoption as a base for artificial teeth.

One great objection to inserting such a mass of rubber as would often be necessary in restoring contour, is the deleterious effect it has upon the mucous membrane in the mouths of a great many persons, caused by its non-conducting properties. This brings us to the true explanation of the mischief wrought by vulcanite — not because it has failed to sustain the promise of usefulness it first gave, for its merits are such that, for certain important uses, its place cannot be supplied by any other known material; not because of the annoyances of the Goodyear patent agents — although these are serious enough, and have led to much demoralization — but because dentists themselves have failed to recognize the true value of the material, and they have made an incidental quality its prominent advantage and their real motive for using it, namely, its cheapness.

They have used it thus in that under-bidding of rival practitioners, which is the burning disgrace of dental practice. They have advertised their cheap wares to the world till the community looks upon vulcanite as a material which costs nothing, and think that the work spent upon it has not much more value; whereas ten years ago they could scarcely overcome a patient's prejudice in favor of gold, now they have so thoroughly demoralized the people that they will not have gold when the necessity of the case requires it.

Were it merely a question of cheapness it would not be so serious, for it is a maxim of political economy, that he is a pub-

lic benefactor who reduces the cost of articles of necessity; but it is no benefaction when the value is reduced in like proportion, and it becomes an imposture when the value is still more reduced. Cheap dentistry is like dollar stores and gift enterprises—you may possibly get the value of your money, you most probably will not. Now and then a dollar may buy ten dollars' worth, but in the long run the inevitable laws of barter will prevail, and the dollar will only buy the dollar's worth.

There is no more certain law than that cheap work leads to bad work. If proof of this were needed in dentistry, look at the shapeless, inartistic, badly-fitting lumps of rubber stuck over with staring bits of porcelain, which issue from a thousand dental offices—*false teeth*—most appropriately named; false to every idea of truth, beauty and fitness; made by men false to all proper sense of professional pride and duty; worn by persons false to their own self-respect and dignity, in permitting themselves to be thus disfigured and made ridiculous.

A dentist who is mean enough to get work by under-bidding, will be dishonest enough to make it correspond to the price; and this has come to be a common, and, alas! an accepted excuse for not doing what the case requires: "I cannot afford it at the price I get." Hence, cheap dentistry is dishonest dentistry, when the price is such as to prohibit the fullest exercise of skill.

A dentist who works at prices which demand unceasing toil to earn his daily bread, leaves himself no time for mental culture; his work becomes a drudgery, in no respect more elevating than that of a common day laborer. Hence, cheap dentistry is degrading dentistry.

We sum up our charge against vulcanite—or, more correctly, its abuse—in that its cheapness and a certain facility of construction has tended greatly to foster cheap dentistry, and so make the dental art slovenly, dishonest and degrading; it has been so used as to lessen the demand for art and skill, and to encourage a community to prefer economy to artistic workmanship.

Let us hope that when specie payments shall have been resumed in our country, cheap vulcanite work will have breathed its last, and both mercantile and dental worlds have new life infused into them by a return to the old-fashioned GOLD BASIS.

PROCEEDINGS OF THE IOWA STATE DENTAL SOCIETY,

At Iowa City, July 12th, 13th and 14th, 1870.

Reported by Dr. Huff, of Iowa City.

[Only such portions of the proceedings are published in this Journal, as are considered of *general* interest. — Chase.]

Question — "May teeth be extracted during pregnancy?"

In an essay upon this subject Dr. Tulloss took very decided ground affirmatively. He believed the operation to be entirely innocuous, and the relief to the patient in such interesting condition, to be very important.

During an experience of fourteen years, in which he had never hesitated to relieve the sufferer of pain in such condition, in cases where extracting is demanded, he has never known an instance of trouble growing out of it. He believes his experience is entitled to some weight in the formation of an opinion. He had examined thoroughly the medical authors on the subject, and found himself sustained, in their silence of the light danger attributed, only one of them, (Churchill on Midwifery,) regarding it as at all dangerous, and placing it among the minor dangers, in his list of causes liable to produce miscarriage; such as a hearty laugh, a mis-step or a jar.

It is not always easy, the essayist averred, to distinguish when pregnancy exists. Grave difficulties in the formation of an opinion on the subject, that of the necessities of meddlesome inquiries concerning a delicate subject, those of the obscurity of the symptoms often, when obtained by inquiry, were such as to puzzle the masters in that branch of the medical profession, as is plainly discernible from the statement of the best authors. Therefore, would not turn off his patient to suffer for weeks or months on the suspicion of that condition. It is the height of cruelty, thus to do. He would relieve the suffering, believing it to be (ceteris paribus) more important, as less of a shock and of danger to the patient than the continuance of the pain. True, there are conditions and circumstances under which I would not

operate, as for instance, if the lady is in the habit of miscarrying, and the visit is at that stage of pregnancy when that accident may be looked for, and other untoward conditions or symptoms might deter me from it, but I wish to be understood as referring to cases otherwise unobjectionable.

Dr. W. O. Kulp, of Muscatine, does not extract teeth during pregnancy. In the present state of medical and dental science, we can control almost every case of suffering from the teeth without resort to extraction. Believes it very important to preserve the natural teeth, and by every means within his power he undertakes to carry that point, if feasible, with his patients. Believes it a good plan (speaking of extracting in general terms) to make the extracting process as painful and horrible as possible, in order to deter people from resorting to it. Hence makes little use of anæsthetics in such cases.

It is our duty to educate the public up to the idea of the importance of retaining their teeth, and this cannot be done by yielding to every solicitation to extract.

We can control the pain and save the teeth, and we ought to do so. His experience has not been as favorable as gentlemen who have spoken before him. Had had trouble. Relates three cases of miscarriage, in his practice, from the extraction of teeth during pregnancy. One of the parties of whom he learned afterwards, had had the extracting done to *bring on abortion.* Said she always kept a tooth to be extracted when she became "in the family way."

Dr. Watson, of Waterloo, regards the "shock" and injury of the protracted pain, quite as great to both mother and fœtus, as the shock and danger of teeth extraction. And in any and every case not immediately amenable to treatment — as some cases are not — believes in the speedy removal of the suffering.

Dr. Hardman, of Muscatine, believes that there is danger of becoming over-cautious, from the occurrence of any accident to our patients. Has never hesitated, in needful cases, to resort to extraction, and never in the course of a large practice, which has extended over nearly thirty years, has he had or seen a case of injury resulting from it. Therefore, in all cases where he finds

himself unable to control the pain readily, extracts the offending tooth. In cases of necrosed teeth, we do no violence in relieving the patient of the pain, but we do violence by allowing it to continue. The doctor dwelt a little time on the ambiguities in the "signs" of pregnancy and the wrong of leaving the patient to months of suffering on suspicion of it.

Dr. Sayles, of Lyons, has no fear of injury, has never seen any resulting and believes it better to relieve the suffering at once.

Dr. Anger, of Davenport, opens the discussion upon this topic by a suggestion that there are peculiar nervous temperaments on whom he would hesitate to practice tooth extraction during this condition.

Dr. Sanborn, of Tabor, sustained the opinion of the essayist, and does not as a rule hesitate to extract teeth in the condition of pregnancy.

Dr. H. S. Chase, St. Louis, being called up, accords, in the main, with the opinion of the essay. Regards the large experience of the essayist as entitled to great weight.

His, (the essayist's,) experience in extracting has been much greater than his own, (the speaker's). Has never paid but little attention to the existence of this condition, if the case was one that called for extraction. Have never had nor has known of unfavorable result.

Dr. Minor, of Davenport, has operated, but always is very cautious, as to time and condition of the patient at the time.

Dr. Smith, of Iowa City, is glad to hear gentlemen express caution in respect to this operation. It is significant, it shows that notwithstanding the positive assurances of harmlessness, there is still in their own judgments danger. He believes there is danger. One that has been entirely over-looked in the discussion thus far.

Granting that the danger of miscarriage is slight, that the danger to the mother is not to be seriously regarded, there is an impression upon the fœtus-in-utero, which ought not to be overlooked.

It should be a subject of our care as well as the mother. The

law makes it a subject of care and interest after a certain stage of gestation.

The question is, is it possible to perform so serious an operation, without a serious impression upon the embryo. The hyper-excitation of the nervous system, and an enlargement of the area of circulatory system, and special increased functions of the nutritive processes, as relates to the subject,—in utero—were minutely described by the doctor, and the conclusion reached, admitting his predicates, that it is entirely unsafe to the future welfare of the embryo, to extract teeth during pregnancy.

Dr. Severance, of Davenport, endorses the views of Dr. Smith.

Dr. Woodbury, of Council Bluffs, would not extract if the patient does not freely consent to it. It complicates trouble if there is not a perfect consent on her part. Thinks there is no trouble to apprehend if she does.

Drs. Kulp and Smith, further elaborated their views on the question. Kulp would not extract in such cases because he is opposed to extracting teeth "on general principles" (our phrase). He does not extract now-a-days for "exposed pulp." That is amenable to treatment. And if the pain depends upon peritonitis, we do not reach the trouble, therefore would not extract at all.

Mr. Smith elaborates his theory concerning the impression made by the shock on the fœtus, through the involuntary forces, although the will may control the voluntary, and hold the patient tranquil.

Dr. Tulloss, rejoined on Kulp. Don't regard an old necrosed tooth, an old "snag," or fragment of a root buried in the jaw a natural tooth, demanding conservative practice. Gives way to man in conservatism in practice, but there are constantly cases occurring that put these considerations entirely aside.

Dr. I. P. Wilson, President, read an essay on the subject of

FOOD FOR THE TEETH.

This was a very well written essay, the writer having evidently thoroughly matured his opinions upon the topic discussed, and expressed them without equivocation, and with a particularity that left no ambiguity as to the points he desired to set forth.

Though dissenting from some of the *popular* points taken, we

have placed it, in our judgment, among the very best essays read before the society.

Referred to Committee on Publication.

Growing out of the positions taken in this essay, a spirited debate sprang up on the subject of food, bearing particularly on the pernicious effects of bolted flour, as depriving it of an essential element of tooth structure, and other important tissues of the body, which no medication can remedy. Dr. Chase came to the support of this long cherished theory with enthusiasm, and was supported in his view by the essay, by Sanborn and Smith, both of whom spoke at length in very scientific phrases.

Dr. Kulp took the view that while medicinal agents, containing and intended to supply to the system the deficient lime-salts, may not produce the direct benefit, and fill by direct processes the demand of the system, yet their indirect effect in modifying secretion and changing the actions of organs are frequently beneficial and important, and he deemed it unwise to ignore their exhibition.

The debate ran high for a few minutes, participated in by the gentlemen above named, and Drs. Tulloss, Severence, Anger and Sanborn.

WEDNESDAY AFTERNOON.

Dr. Sanborn, of Tabor, read a carefully prepared essay—subject, "Vital Phenomena." Referred.

Following this, an essay written by Dr. W. D. Taylor, of Ft. Madison, and read by the President, Dr. Taylor not being present. Subject: The Old Woman who Lived in a Shoe.

> "There was an old woman who lived in a shoe,
> Who had so many children she knew not what to do.
> To some she gave nothing, to some she gave bread,
> Some gave a spanking, and put them to bed."

This "old woman," the essayist felt sure, was not a "woman of the period." Her surroundings and her treatment of the family forbade such a belief; on the contrary, how different from the practices of the women of the present day is the regimen of that household. And who shall say that it was not every way superior in a sanitary and moral point of view to the customs of the present time (or words to that effect).

From this point the writer developed the idea of the importance of strict attention to the daily habits of the family as regards eating, drinking, sleeping and living, as bearing upon the subject of health and morals, and criticized the modern habits and manners of civilization. ———A good thing———. Referred to the Committee on Publication.

Essay by Dr. P. T. Smith, Iowa City. Subject:

THE PHILOSOPHY OF DISEASE AND MEDICINE IN THE HUMAN SYSTEM.

This was a lengthy and laboriously prepared essay, in which its author elaborated with minuteness a theory of electro-nervo-mento-force (our nomenclature, not his) as the single power for the regulation or disturbance of the functions of organs, determining the sequences of physiological action as to health or disease.

The view taken starts with the fact that the brain is the fountain of the nervous system, and the hypothesis that electricity is the agent of the mind, doing its behests through the medium of the nervous system. That there are two modes of disease, one by mental impressions acting on the physical system, and, *vice versa*, physical causes impressing the nervous system.

The *modus medendi* of the influences and their results were elaborated minutely, and the inferences of the laws of health noted.

The "Philosophy of Cure" was then explained, taking radical views concerning the *damaging* effects of all medicines upon the system. Referred to the Committee on Publication.

Essay by Dr. Hardman. Subject:

THE EVILS ARISING FROM VULCANIZED RUBBER IN DENTISTRY.

This paper takes strong ground against the use of this article as a base for dental structures. That it is dangerously damaging to the health of the wearer, and is every way worthy the utter condemnation of the profession. The essayist gave the composition of it, as reported by Professor Silliman; and in view of the fact stated by that distinguished chemist, that fully one-third of it is a sulphuret of mercury, argued the *poisonous* effect of this preparation of mercury on the system.

This paper called out the great battle of the convention. The positions taken by the essayist were supported by Drs. Chase, of St. Louis; Smith, of Iowa City; Sterneman, of Cedar Rapids; and were attacked by Dr. Kulp, of Muscatine. He believes the objections urged against rubber plates to be fallacious. He used it extensively; had never seen injurious effects from it that did not accrue to those wearing metallic plates.

The propositions given in the essay of the composition of vulcanized rubber were incorrect, and its conclusions alike incorrect. There were many points in the practice of dentistry now demanding the use of rubber; we can't do without it. Then why take ground for its expulsion from use?

Dr. E. C. Chase, Iowa City, read a very carefully prepared and scientific paper on

THE CHEMISTRY OF THE SALIVA.

This paper elicited favorable comment from the oldest and leading members of the society. Dr. Kulp was glad so young a member should signalize his entry into the society by the production of so able a paper.

Dr. Sanborn thought that the disposition to usefulness which characterized this young member should be regarded as a laudable example for the elders.

Referred to the Publication Committee.

An informal discussion sprang up at this stage, led by Dr. Kulp, concerning the methods of filling — devitalizing the nerve, destroying the pulp, and preparing the cavity for the reception of filling, &c.

Dr. Chase, of St. Louis, spoke at length, succeeding Dr. Kulp. Others also made brief remarks.

Dr. Smith, of Iowa, delivered a lecture before the society on the "Philosophy of Mechanical Dentistry." This lecture, which occupied about an hour in the delivery, was a clear exposition of the laws of force entering into and influencing the stability of the mechanical structures fitted to the mouth. This the lecturer demonstrated by diagrams and specimens prepared for the purpose. The lever principle, which enters largely into those laws,

was happily demonstrated, and computations made of the exact rate of force operating upon the different points of the teeth structures, and hence the considerations that obtain in their construction. The subject of

HEAVY FOIL

Being under consideration, Dr. Chase, of St. Louis, being called upon, spoke at length, explaining his experience in its use, and his conclusions therefrom. His conclusions, in effect, are that the "heavy foils" possess advantages in practice that cannot properly be ignored, and yet not to supersede entirely the use of low numbers.

That the proper weight for ordinary use, with "mallet pressure," is No. 30; that he often uses No. 60, and some of his neighbors in St. Louis have used with satisfaction as high as 120; that for use without "mallet," No. 20 is a very desirable variety. It is perfectly amenable to manipulation, and has the advantages of greater adhesiveness and ductility, being more readily pressed into the remote cavities of the roots than the low numbers, 3 and 4. It resists the point of the instrument, and is not, consequently, punctured by it, but pressed before it into remote cavities, its malleability being greater. He does not find any trouble in filling by the side of frail structures by carefully sliding the foil by the side of such. The use of these high numbers, also, has the effect of cheapening foil, inasmuch as it enables the use of rolled foil, which is much less expensive, besides these higher numbers can be "rolled" by dentists themselves, thus avoiding another source of expense.

The doctor spoke of having used recently an article of "shaved gold." Explained the process of making it, and pronounced favorably upon its quality. In very small cavities, of course, the low numbers must be used.

The subject was further and fully discussed by Messrs. Kulp, Muscatine; Thomas, Nebraska City; Rigby, Tipton; and the President, Dr. Wilson, all in corroboration of the views of the first speaker.

In connection with the above topic, the subject of the utility of the "automatic plugger" was discussed.

Dr. Thomas regards it as invaluable in his office. Dr. Chase has not been favorably impressed with it. Prefers a living hand to any and all automatic pluggers. Thus "doctors disagree" as usual. In answer to a question, Dr. Chase said he used and preferred the old-fashioned wooden mallet to any other, having used them all, and discarded all, back to the old black walnut mallet, like that with which he practiced in the days of his youth.

THURSDAY EVENING.

The session this evening opened with a discussion on the subject of "Oral Surgery," which lasted the first hour and a half, embracing the various operations that come properly or frequently under the hand of the dentist.

During which Dr. Kulp gave a mock clinique of his method of operating for hare-lip. An extensive experience was then given by a large number of the members in diseases and treatment of the ANTRUM. On this subject Kulp, Tulloss, Smith, Rathbun, of Oskaloosa; Dr. I. P. Wilson, Dr. Hardman, Rigby, of Tipton; Ray, of Bellevue; Anger, of Brooklyn; Shattock, of ———; and Woodbury, of Council Bluffs, reported cases.

The society next considered the place of holding the next meeting, resulting in the selection, by ballot, of Council Bluffs as the place.

Committee on Dental Legislation reported through Dr. W. O, Kulp to the following effect: That the committee had prepared a bill, such as in their judgment met the wants of the profession in the State, and visited the capital during the session of the Legislature. Were given a hearing by one of the Legislative committee, and had the satisfaction of securing the coöperation of the committee, and its recommend to the "House," but the House killed it dead. Among its friends in that body, he felt it due to mention Hon. Mahin, of Muscatine; Hon. John P. Irish, of Iowa City; and Dr. Wasson, of Blackhawk county. There were many others, but failed of receiving general favor, and died.

Dr. Hardman brought to the attention of the body the action being taken by the dentists of Illinois and other States relative to a testimonial to Dr. S. C. Barnum for his gift to the profes-

sion of his invention of the "rubber dam." The following resolution was adopted:

Resolved, That the Treasurer is hereby instructed to send to Dr. Dean, of Chicago, twenty dollars, to be addressed to the Testimonial Fund intended for Dr. S. C. Barnum for his gratuitous gift of the rubber dam.

Election of officers resulted in the election of the following named gentlemen for the coming year:

President—Dr. I. P. Wilson, Burlington.

Vice-President—Dr. N. H. Tulloss, Iowa City.

Secretary—Dr. E. C. Chase, Iowa City.

Corresponding Secretary—Dr. W. O. Kulp.

The Code of Dental Ethics adopted by the sixth annual meeting of the American Dental Association was then read, and, on motion of Dr. Smith, of Iowa City, was adopted.

INDIANA STATE DENTAL ASSOCIATION.

The Association met at the lecture room of the Indiana Medical College, at Indianapolis, June 28, 1870.

President John F. Johnston called the meeting to order at 2 o'clock P. M.

After the usual routine of preliminary business the subjects for discussion prepared by the Executive Committee were taken up.

1. "Hypodermic Medication as it pertains to Dentistry."

Dr. W. F. Morrill having been appointed by the President to open the discussion upon the above subject, came forward and read a very ably written essay, showing that the author is well advanced in what pertains to this subject.

Prof. Judd, of St. Louis, having been previously elected an honorary member, was called upon to take part in the discussion. He then related several interesting cases that had come under his observation where hypodermic medication had been of incalculable benefit.

Drs. Hunt, Moore, Knapp and Rawls followed, until the subject was closed, and the second question taken up.

2. "What are the Indications for Destroying the Pulp?"

Dr. Knapp opened the discussion with a carefully prepared essay, reviewing the grounds the profession have passed over in the last fifteen years in their efforts to save the pulp alive, and congratulating the members upon the probable attainment of that end in the use of os artificiel for capping.

Prof. Taft, of Cincinnati, contended earnestly for the saving of the nerves of the teeth.

Prof. Judd, of St. Louis, Prof. Watt, of Cincinnati, Prof. Moore, of Lafayette, and others, followed, all advocating the protection of the nerve by the means now employed by all thorough dentists—oxy-chloride of zinc.

The third subject having been passed over informally, the fourth subject was opened by Prof. A. M. Moore, of Lafayette, essayist.

4. "Filling Teeth with Gold."

Prof. Moore described minutely the class of fillings where the cavity is complicated with fissures, illustrating his ideas with a specimen very finely executed on the natural organ.

This subject having been generally discussed was concluded, and the fifth subject opened by Dr. Morrison.

5. "Treatment and Preservation of the Deciduous Teeth."

Dr. Morrison read a very able paper on this subject.

6. "What is the Best Substitute for Vulcanized Rubber,"

Was participated in first by Dr. Hollingsworth, who was invited to address the Association on the process of casting alumi num base, as discovered by himself. He accordingly explained his method, and in the presence of the Association cast a plate. The invention consists of à "plunger" that forces the metal white hot into the sharpest angle, thus overcoming the trouble experienced by its failure to make a cast of its own weight.

Dr. Keightly has a process of his own for the preparation of aluminum, which metal he prefers to rubber.

Dr. Feemster, of Greencastle, also described his invention for casting aluminum plates, and illustrated his apparatus on the blackboard.

Prof. Watt, of Cincinnati, regards aluminum as much better

than rubber; is of the opinion, however, that it would not prove to be entirely satisfactory. His experiments had been made with a view to get something more easily manipulated than aluminum, so simple as to induce even tyros to abandon the use of rubber, and thought he had succeeded in obtaining an alloy that is easily cast into plates. It is known as Williams' improved alloy. This alloy successfully resists sulphur, oxydation and chloridation. He was of the opinion that humanity had been poisoned long enough with that infernal rubber nuisance. Prof. Watt also exhibited platinated silver, a combination for upper plates that swedges about as readily as aluminum; is pure in the mouth; teeth can be attached with the above alloy, or soldered if preferred.

Dr. Stanley spoke in favor of Watt and Williams' alloy. Retains its color better, if any odds, than aluminum.

Dr. Feemster thinks in all the sixty-nine elements nothing is so admirably adapted, on account of its lightness, strength and purity, as aluminum.

Prof. Judd, of St. Louis, has been as anxious to see rubber go out of use as any one, for several reasons: the first and greatest being because he was satisfied, after thorough investigation, that thousands were annually poisoned with it; thinks aluminum will withstand the juices of the mouth perfectly, and is vastly superior to rubber in all shapes and forms.

Dr. Morrill has observed deposits of lime and other secretions from the mouth on aluminum plates, when they have been worn any length of time, even where particular care has been exercised. He advocates rose pearl as a substitute for rubber. It can be made more thin, it is lighter than aluminum, its color a close imitation of nature, it is nearly as cheap as rubber, and thinks it is bound to come into general use sooner or later.

Discussion having closed on this subject, Dr. Driscoll read a paper on "The Elevation of the Medical Profession."

The election of officers for the ensuing year resulted as follows:

President—W. C. Stanley, of Dublin.

First Vice-President—E. V. Burt, of Lafayette.

Second Vice-President—W. S. Hieskill, of Indianapolis.

Treasurer—C. C. Burgess, of Indianapolis.

Secretary—Seneca B. Brown, of Fort Wayne.

Adjourned to meet in the city of Fort Wayne on the last Tuesday in June, 1871. SENECA B. BROWN, Sec.

INDIANA STATE DENTAL ASSOCIATION.

This association met at Indianapolis on the 25th ult., at 2 o'clock P. M., and was very busily engaged until old Time was just about to usher in the 30th, when it adjourned to meet next year at Fort Wayne. Many papers of much interest were read and discussed by the members of the association, and we think that those present returned to their homes feeling that they had been well paid for the time spent and expense incurred in attending the meeting. Several members of the profession were also present from Cincinnati and St. Louis, and the twelfth session of the Indiana State Dental Association must be recorded and go down to history as a gratifying success. The demonstrations of the feasibility of casting aluminum plates were very satisfactory, the result being reached by three different processes, worked out by three different practitioners, all of which were clearly described before the association. The old fogies who did not attend this session will find themselves farther than ever behind those who have availed themselves of this opportunity to keep up with the progressive spirit of dental science. The merits of heavy foil, both beaten and rolled, were fully discussed, and many other questions of great practical importance considered; and although the number in attendance was much smaller than it should have been, we noticed among them a great majority of those who have any reputation to sustain as active, energetic and progressive members of the profession of the Hoosier State.

J.

We are using Hydrate of Chloral in twenty and twenty-five grain doses, for our nervous patients, a few minutes before they take the chair. Try it. MORRISON.

AMERICAN DENTAL ASSOCIATION.

The tenth Annual Session of this Association met at Nashville, Tenn., on the 2d inst., Dr. Homer Judd, President, in the chair.

The Association was called to order at 10 o'clock A. M., and the exercises opened by a prayer by the Rev. Dr. Summers.

The address of welcome was delivered by Dr. W. H. Morgan.

Dr. C. R. Winston delivered an address on behalf of the physicians of Nashville, complimenting, highly, the progressive spirit of the Dental profession.

Dr. Baird also made a few remarks on behalf of the Tennessee State Dental Society.

The roll being called, the following members responded to their names: Jas. S. Knapp, W. H. Goddard, J. A. Arrington, R. Russell, S. H. McCall, J. Taft, W. H. Morgan, W. H. Shadoan, J. A. Salmon, W. M. Taft, G. S. Field, Homer Judd, W. O. Kulp, R. N. Lawrence, L. Augspath, S. B. Palmer, R. Freeman, E. Honsinger, J. R. Walker, J. D. Sheppard, J. F. Edams, J. O. Holmes, B. B. Alfred, A. C. Ford, Thos. T. Moore, J. N. Cram, W. C. Dyer, H. J. McKellops, S. J. Cobb, A. C. Cook, E. S. Cogswell, W. H. Dalhears, J. G. H. Brown, Isaiah Forbes, J. W. Keeley, J. Fouché, W. A. Smith, Corydon Palmer, P. S. Dickerman, J. B. Coolidge, C. P. Baird, S. P. Cutler, C. C. Carroll, S. C. Chesholm, J. C. Ross, H. E. Peebles, R. G. Porre, W. H. Burr, W. H. Allport, M. Corcoran, E. Floyd, J. S. Newholm, S. N. Dennis, W. T. Morrill, G. A. Mills, W. A. Jones, E. R. E. Carpenter, E. A. Herman, J. McClellan and J. S. H. Baird.

On motion, the reading of the minutes was dispensed with. On motion, the vacancies in the Committee on Prize Essays were filled, by the appointment of Drs. Taft, Kulp and Walker.

Drs. Walker, of New Orleans, Dr. Ford, of Georgia, and Dr. Peebles, of St. Louis, were appointed to fill vacancies in the Committee on Dental Instruments and Appliances; and Drs. McCall and Fouché, were appointed to fill vacancies in the committee on Voluntary Essays.

Several reports were called for, but as they were not ready the Association adjourned till 3 o'clock, P. M.

AFTERNOON SESSION.

Association met at 3 o'clock. President in the chair.

Committee of Arrangements reported names of delegates who were entitled to membership. The report was adopted.

Dr. Atkinson, chairman of the committee on Pathology and Surgery, read a report which led to a lengthy discussion, which was not finished at the hour of adjournment. So the subject was, on motion, continued for the next morning session, and the Association adjourned to meet at 9 o'clock, A. M.

SECOND DAY.

Association met at the appointed time. Prayer by Dr. Young.

A letter from Dr. Geo. Watt, resigning his membership in the Association was received and read by the Secretary. On motion resignation accepted.

Discussion on Pathology resumed; Drs. Cutler, Walker, John Allen, Morgan, Kulp, Jones, Crouse, Moffit, Forbes, Peebles, Judd and Atkinson, occupied the time, until the adjournment; Dr. Walker drawing especial attention to the diseased condition produced by wearing rubber plates in the mouth.

At the afternoon session the discussion was resumed and continued till adjournment.

THIRD DAY.

Association met at 1 o'clock. Prayer by Rev. Dr. Baird.

Report on Operative Dentistry was read by Dr. Cushing, and two papers on the same subject by Dr. Knapp, of New Orleans. The latter advocating the use of cylinders in filling teeth. After discussion, adjourned to meet at 8 o'clock, P. M., for the purpose of electing officers.

At the night session the following were elected officers for the ensuing year:

W. H. Morgan, President. S. W. Dennis, 1st Vice President. J. R. Walker, 2d Vice President. J. A. Salmon, Cor. Secretary. M. S. Dean, Recording Secretary. W. H. Goddard, Treasurer.

Green Brier, White Sulphur Springs, was finally decided upon as the place of holding the next meeting. The

FOURTH DAY

was taken up with discussions upon the various reports which had been submitted, and miscellaneous business.

Dr. McClellan, against whom charges had been preferred, for advertising, at the last meeting, made a statement which was declared to be satisfactory and the case dismissed.

The amendment to the constitution, proposed at the last meeting by Dr. Buckingham, which proposed to exclude from the Association all practitioners who were in any way interested in dental patents, was defeated by a large majority.

Dr. Corydon Palmer addressed the Association at considerable length upon the subject of "Operative Dentistry."

Dr. Hollingsworth, of Indiana, demonstrated his method of casting aluminum plates, which proved to be a complete success.

On motion the President elect was conducted to the chair.

A vote of thanks was unanimously tendered to the retiring officers for the manner in which they had performed their duties.

A gold medal and $1000 in cash was voted to Dr. Barnum for inventing the Rubber Dam. The medal being donated to the Association by three members for that purpose.

Dr. Atkinson then addressed the Association, upon "Capping Nerves with Oxy-chloride of Zinc," and upon "Treating Receding Alveolar Processes," after which, at about 6 o'clock P. M., of the fourth day, the Association adjourned.

JOURNAL STOCK FUND.

Editors Missouri Dental Journal: — Please excuse the committee on Publication for not presenting the tabular sheet showing the status of the "Journal Stock Fund," for publication this month, as some are still in arrears that mean to pay up, and some thought they had paid through another source; therefore, the committee desire a little more time.

H. E. PEEBLES, for Com.

The Missouri Dental Journal.

A MONTHLY RECORD OF THE SCIENCE.

VOL. II.] SEPTEMBER, 1870. [No. 9

From the Philadelphia Dental Times.

ASSOCIATION AS AN ELEMENT OF IMPROVEMENT.

An Address delivered by SAMUEL WELCHENS, D.D.S., before the citizens of Pittsburgh. Published by request of State Dental Society of Penn.

Continued from Page 289.

A germ contains all the principles necessary to develop the towering oak; but this principle of dependency upon correlative agencies, calls into action moisture, heat, light and the gases of the atmosphere as essential conditions of vegetation, without which there could be no growth, and the germ would remain forever but a particle of inert and worthless matter.

The solar system is composed of myriads of worlds and planets, with no special sympathy or affinity with each other, and if destitute of correlative forces, or if influenced solely by abstract repellent isolations, they would wander in the immensity of space, and destroy each other by forcible contact, or terrible explosions, occasioned by the approximation of volatile and heterogeneous gases. But by the ASSOCIATION of the law of gravitation, with the elementary and chemical equivalents of the atmosphere, and centripetal and centrifugal forces, each planet is held in its respective orbit, systems revolve round systems in perfect harmony, and this order of the universe becomes another important witness to the efficacy of association in every department of nature.

No structure, whether organic or artistic, can attain to any degree of usefulness or perfection without it; and all through the labyrinths of professional science and historical research, in government, in moral and physical culture, or even the minor details of life, no great or brilliant results have ever been achieved where the power and efficacy of association have been ignored.

Even the language, habits and movements of individuals are influenced by it, and are fraught with happy, graceful results, or awkward, halting, slothful characteristics, just in proportion to their facilities for associated intercourse with kindred spirits.

Education is but a systematizing of the faculties and powers of the mind, so as to enable it the more readily to grasp and analyze the great problems of life as they present themselves in varied forms before us. But no system of education could ever prove to be successful in the accomplishment of such ends, if it were founded upon abstruse and isolated abstractions. The finer and purer and more useful triumphs of science are the true component elements of education. But they are strengthened and sharpened and established alone through the stimulating energies of ASSOCIATION.

My object is to apply this philosophy to the formation and workings of association, in the development of the learned professions, and more especially to that of *dentistry*.

In all the essential requisitions of improvement in any profession, these societies have a leading and powerful influence. It is not only in scientific culture that improvement is felt, but the social benefits are of incalculable value.

If the interests and dignity of a profession are to be advanced, and its standard of excellence elevated, it is most important that a laudable emulation be encouraged among its members, to incite them to earnest inquiry, and a progressive individual energy. These are the elements of improvement and success, but they have no fellowship — no growing affinity with the characteristic attributes of a mean prejudice.

If they are to have a free untrammeled exercise of their powers, the corrupting influence of jealous natures dares not contaminate the soil designed for their propagation. But a cordial cul-

tivation of the higher powers of the mind, and the nobler impulses of the heart, through an intimate acquaintance and friendship of the members of our craft, one with another, as is the tendency of these societies, is the surest method of propitiating those baser and sinister tendencies, and of opening the way to dignity and manhood.

The first step toward such a movement—the mere desire to unite in such an enterprise—is of itself the exercise of an energy in the direction of that noble endowment of the heart, which does not only make us better members of our profession, but better citizens and more useful members of society.

Those petty jealousies and disreputable business prejudices which enter so largely into every community, and become so baneful in almost every business enterprise, are nowhere so reprehensible as among members of the same profession, especially those who hold positions of respectability.

They retard the progress of intellectual and scientific improvement, and destroy every incentive to research and discovery, thus losing to their profession the acumen of their minds and experience, which, if under better discipline and a more hopeful influence, might add honor to themselves, and useful and brilliant acquisitions to their vocation. To nurse and indulge such a spirit is the most certain way to destroy a man's influence for good; for it renders him morose, sullen, designing and selfish, with no good word for any one and no praise, save for himself.

Instead of those higher qualities of his being, of which we have just been speaking, sordid avarice takes possession of his life, and improvement, that should flow from his participation in any scheme or compact of social intercourse with his neighbor, is nowhere to be found.

Such men are sometimes found in the liberal professions; but they are rarely seen in associations formed for the advancement and improvement of such profession. If they come in at all it is to obtain position, or to have some honor thrust upon them, which they had not genius or energy to call forth themselves. Disappoint them in this, or fail to make leaders of them, and they again retire into their wanton, slothful and selfish habits.

Contrast the life of such a narrow-minded, hide-bound individual, with the full, free, open expanse of a being whose life and habits have been trained in the school of fraternal intercourse. One who enters a profession to reflect honor and credit upon it, and who comes into every measure designed to prove his love for his calling, and a mutual benefit to both, and the advantages of those associations stand out in bold relief.

He is thus qualified to meet his patrons, not only in the routine of scientific competency, but as a conscientious gentleman, easy and affable in his manner, sympathetic and tender in his bearing, with more of a desire to do them good than to get their money, and he will meet both the requirements of his profession, and the wants of the public in such a manner as to insure him a useful and brilliant career.

We will now turn to a contemplation of the real substantial benefits of those societies in a scientific point of view.

Professions are not made, they grow. They are either adventitious buds from some parent stem or trunk, or they are regular growths from germs lodged in the rich prolific soil of science.

They are thus creatures of circumstances and conditions, and require nutrition of a substantial character to secure their development, just as much as the growth of a vital organism would. A profession cannot live upon abstract theories and isolated dogmas. There must be an orderly and progressive exercise of the elements of growth and improvement, in order to establish an energetic and hopeful status.

Dentistry, though a branch of the healing art, is, nevertheless, a profession of legitimate birth. It was practiced as a distinct branch of surgery by the Egyptians, as far back as twelve hundred years before the Christian era, and the complications of the teeth with the adjacent parts — their important position and the character of their functions as organs of the highest type of structure, gave it as a separate branch of surgery the very highest position in the role of professions as then practiced.

Like other objects of growth, dentistry may be said to have three stages of development. The first we will designate as that

of infancy. The second of youth or pupilage; and the third, (though in a comparative sense), that of maturity.

We characterize the remote history of our profession as an infantile stage, because, in being confronted with the stern realities of diseased and aching teeth, the ancients, in their remedies for those "distempers," as they styled them, exercised far more superstitious quackery, which seemed to be the result of ignorance and inexperience, than scientific, or even common judgment, in which an advanced stage of development might be evinced.

The malady then, as now, was, no doubt, as excruciatingly mature; but the remedy, either as medical or surgical, was of that order as to stamp it with the imbecility of infancy.

Genius and correct scientific theories were not wanting in those days; but the prevailing superstitions led to the most ridiculous expedients, and true skill and science, (which are always modest,) were kept, to some extent, at least, in the back ground.

There were then, as now, two elements striving for the mastery. The one was the honest promptings of the true devotee of science; while the other reveled in an atmosphere of quackery, and took hold of the crude ideas of the people; the latter has always been the most successful.

The faint glimmering of science in those, say: "I know well that many believe there is no better remedy for toothache than extraction; but before proceeding to that there are many other remedies that may be successfully employed. It is not necessary to proceed at once to extraction, even though caries exist, for, by removing the decayed portion of the tooth with a sharp cutting instrument, such removal causing no pain, whatever remains is as sound as a perfect healthy tooth."

Quackery was equally solicitous about retaining the tooth, probably on account of their inability to extract them, but less scrupulous in its restoration to health.

Accordingly, there were amulets and other superstitious means employed to allay the pain; and not unfrequently such ridiculous notions as the following would be entertained and resorted to, as expedients, for the want of better theories by which to humbug the people: "The tooth will drop out by itself if it be

rubbed with AFRICAN SPONGE, but care must be taken not to meddle with a tooth which is healthy."

The aversion to the extraction of teeth gave rise to many curious expedients to get around a most difficult and dangerous task, and accordingly they resorted to the actual cautery, in the use of hot iron and brass needles, and hot oil and butter to destroy the pulps of painful teeth, and "numerous caustic medicines, the intended effect of which was to make the teeth exfoliate," and thus they would destroy them rather than extract them.

Teeth were filled, too, with lead in those days, but the object seemed more for the purpose of strengthening them for the operation of extraction than to preserve them from further decay. For stopping them when carious, a sort of gum was used, or the decayed part was scooped out with a common scalpel. This sort of treatment was in vogue in the days of Celsus, who flourished about the commencement of the Christian era.

This slow progress in the healing art, from the time of Esculapius to the days of Celsus, a space of about twelve hundred years, shows the scientific animus of those earlier years, and is a fitting commentary upon the virtue and power of colleges and professional societies, to carry forward and upward that matchless development which has characterized the present age, and the latter-day glory of the scientific world.

At a still later date we have accounts of artificial teeth being set on wire, and carved out of ivory, but to what extent this practice was carried we are not informed.

The history of those ages is but a catalogue of this kind of practice, more or less ridiculous, and alternating between the devotees of science, even in its incipiency, and the crude notions of the ignorant and superstitious mountebanks, who seemed to be about as plentiful then as now.

This, then, faintly shadowed forth, is a glance at the infantile stage of our profession, and may be regarded as reaching, in this fashion, down to the beginning of the last century.

"In the year 1700, persons destined for the profession of dentistry were compelled, in France, to undergo a regular examination. It is from this period, perhaps, that we must date the es-

tablishment, in modern times, of the dental art, as a distinct branch of the medical profession;" and from this time forth its pupilage may be regarded as in vigorous and successful operation.

We have neither time nor space to dwell upon this part of our subject. It is not important that we should, but the superstitions of the ancients, and this narrow, time-serving jealousy, of which we have already spoken, seem to have been inborn elements with those who presumed to practice in a profession which has always been too lenient and too easy of access. Accordingly, it is not beyond the recollection of some of our oldest practitioners, when this spirit still reigned supreme, and for a man of ordinary intelligence and genteel address to enter a dental office, would usually produce considerable commotion. There would be as much nervous perturbation and smiting together of the knees upon the part of the operator as that of the patient.

The latter would quake and tremble for fear of the jaw-breaking operation of extracting a tooth; whilst the former would tremble and quake, lest the latter would steal the business.

There was thus any amount of jerking, dodging and rapid nervous concealment of instruments and appliances, lest quacks should spring up, and, by their bungling work, cheat the people out of money and teeth both.

If one of those characters chanced to discover a new thing, whether forceps or file, or excavator, hand-mirror, chair, or even tooth powder, he would straightway get a patent for it, and woe to the infringer thereof. The indignities and anathemas of the whole civil code would descend upon his devoted head, with a certainty and severity which would put to blush the prettiest efforts of old Josiah.

They also exercised a commendable solicitude, not only for the protection of their patients against bad work, but against exorbitant charges also; and lest the dear people would, in some way, be cheated, they would insure their work, or give it out on trial, and emulate each other in establishing starvation prices. Some of these habits, I am sorry to say, have followed the profession even into maturity.

As the youth grows and his mind expands, so the profession

has grown, despite the efforts of some of its slothful and unprincipled members to drag it to the earth, in endeavoring to make it subservient to their own aggrandisement.

Its final stage of development, however, may be gathered up in the present advanced condition of these two ideas, namely: The course of study necessary to a complete dental education, as demanded by the scientific spirit of the present age. The second is that high-toned social code which is more directly developed by those associations.

These combinations draw in every element of improvement. Instruction in the private office should be directed with a view to a thorough and complete collegiate course; and the instruction there should again be followed and established by the discussion of social and scientic benefits of our local, State and National societies.

There are here facilities for every species of instruction and information, and he must be a drone indeed, who does not grasp the helping hand which is thus stretched out to render such important service upon such easy terms.

Another most important element in this process of improve- is a substantial and efficient literature. Where a disposition to improve in a literary culture is wanting, a high-toned standard of excellence cannot be attained. No practitioner, however well his mechanical manipulations may be performed, should be recognized as such, unless careful attention be paid to such study and research as will keep him up with the progressive spirit of his profession. If he stops reading, or ceases to be a student, then should he also stop practising.

This is the life and light of the scientific element in any profession, and for a drone to steal in and bring disgrace upon his calling by a criminal imbecility, as the result of an ignorance superinduced by indolent habits, is an outrage, not only upon the profession, but the commuity at large; and mal-practice, arising from such pretensions, should be subject to severe legal prosecution.

The idea, then, of a mature profession is not to cut off all the

resources of development and progression, but to so arrange and harmonize them as to make them more efficient.

It is so to use and handle the appliances to which I have averted, (and the most potential of which I contend to be those societies), as to fortify all the weak points and out-posts of our profession, that it may prove to be our castle, finished and complete, towering above and beyond the prejudices and jealousies of the world of selfish business interests, and the floundering blunders of professional charlatans. * * * * *

But the people have an interest in this matter. If we confine all the benefits of those associations to the members of our profession, we would defeat the main object of our argument. The improvement thus developed concentrates the energies of the profession, but it is to render more efficient service to those who require it. If a man embarks in a vocation, which so nearly concerns the health and comfort of the people of his community, it is not only his duty to avail himself of every source of information, and every appliance necessary to carry out successfully the pretensions of his craft, but it is the moral duty of the individual members of that community to not only countenance and encourage such schemes of improvement, but they should demand either the preparation and competency which he may obtain from every approved source of information, or his retirement from practice.

Now, my friends, if there is any one thing more despicable than another upon this broad earth, it is a quack community; quack dentists, quack doctors, quack lawyers, quack teachers, and quack statesmen are plentiful enough everywhere, and bad enough in all conscience; but a quack community outstrips them all. I do not mean a community of quacks; such a thing is scarcely possible, since they are unable to live upon each other; but a quack community, a community of average intelligence and ordinary business qualifications, that will submit to the jaw-breaking operations of an ignorant and bungling dentist; the life-endangering practice of an incompetent and self-conceited physician; the ridiculous counsel of a poor half-bred lawyer; the feeble efforts of an empty-pated teacher, and the dark de-

signing chicanery of a mountebank statesman, day after day, and year after year, with no effort to throw off the incubus. This is what we conceive to be a quack community.

Why a system of fraud and quackery should be supported by any class of people is a question entirely beyond our comprehension. How it is that the natural bias of the public mind seems to gravitate to deception and humbuggery, rather than a proper appreciation of the scientific, the noble and the good, we cannot explain. Certain it is that there are antagonisms, and to reconcile them, especially in dentistry, is the object of the formation of our societies.

All that is necessary, to be guided properly, is, to seek information from reliable sources, what your doctor's standing is in his profession. A dentist or physician may deceive the people, but he rarely humbugs the solid mind of his own profession long. Nor is his diploma a sure test of his competency. Those who are graduates of colleges are not at all times our best operators. This of course, is a leading qualification, but some of the greatest charlatans in the professions hold diplomas, and though good as a general rule, those diplomas are dangerous things in the hands of men who will abuse the license they bestow upon them.

It is not there alone that the profession looks in making up the estimate of a man's qualification to practice. It is his faculty, his judgment and his genius, and the moral bearing and attributes of character, after the advantages of a liberal professional education, which make up the totality of his passport to the higher and better judgment of his professional brethren; and just here he must come to become a member of those societies.

An out-and-out quack scarcely ever gets into our societies, and consequently a membership therein should be one of the very best passports to your confidence and support.

In the next place, note his standing in society. He may be a little gassy and conceited, (some of our best men are so), but he must be sober and solid. The brain must be clear and the hand steady that wields an instrument or compounds a prescription, or the individual that would presume to render you medical or surgical aid when in distress should be entirely unworthy your confidence and support.

ALVEOLAR ABSCESS.

[*Continued.*]

Treatment by leeching and scarifications differs in no material respect from the application of cold, so far as the principle is concerned, both looking to the reduction of the congestion, which, in the case under consideration, alone gives rise to the subsequent morbid changes. But if we find that the congestion has already given place to the next stage of the disease, and stagnation has already taken place, common sense as well as experience teaches us that these measures will not now suffice to cure the disease and re-establish the normal functions. In this stage the pain will be much more clearly marked, pressure upon the tooth cannot, as a general thing, be tolerated; there is more swelling, and in some cases the general inflammatory symptoms are severe; pulse hard and quick, pains in head, limbs or back, thirst, and indeed all of the symptoms which mark inflammatory febrile affections; but in many cases the constitutional symptoms are not prominent, and our attention is only directed to the local affection. Now, although the application of cold in this stage will not cut short the disease, as it will very frequently do in an earlier stage, still it is usually attended even here with good results; reducing to a certain extent the congestions which border the points of stagnation, and in that way doing something toward limiting the extent of the stagnation, and therefore assisting our efforts to produce resolution.

Resolution, after stagnation has taken place, may be brought about in favorable cases in at least two different ways. Our first efforts must be directed to that treatment which will prevent the further extension of the inflammation—the increase of the stagnated tracts; and the next object to be sought is the removal of the stagnation points which already exist. The first is brought about by the employment of the means that have already been designated as proper for the first stage, and the second will be, perhaps, more philosophically considered after we have pointed out the two methods in which stagnation points are removed.

These stagnation points—made up of masses of blood corpuscles which seem to stick, not only to one another, but also to the walls of the vessels which enclose them—are sometimes removed by the separation of the corpuscles upon the distal margin of the static mass, one after another, which pass quickly off into the general current of the circulation until the whole mass disappears. In other cases the mass breaks down and liquefies and mingles with the circulating blood.

With these facts before us, what can we do, after having satisfied ourselves that the progress of the inflammatory action has been stayed, to assist nature in carrying out her plans for the removal of these obstructions? It is manifest that our part in this rôle cannot be a very active or efficient one, but we need not however remain entirely inactive. It is at this very juncture of affairs that poultices and emollient applications do good. Warmth and moisture are the essential agents which are here brought into requisition; the one preparing the tissues for the reception of the other, which, penetrating to the stagnated mass of blood, furnishes to some extent the conditions required, either for the separation of the corpuscles from the mass or for their final dissolution. It will be well to bear in mind that if poultices are too persistently used during the next stage of the inflammation, *i. e.*, during the suppurative stage, the abscess may be determined to point upon the outside of the face, and thus give rise to a lasting deformity. Counter-irritants are frequently used in these early stages of the disease, relieving the intensity of the congestion by producing a diversion of a part of the blood to another location, and thus indirectly arriving at the same result as is attained by the more direct and reliable methods indicated above.

If our efforts to control the progress of the inflammation and to bring about a removal of the stasis are ineffectual, the suppurative stage supervenes, and our treatment must necessarily be modified to meet the changed conditions that now present themselves. This stage is sometimes ushered in by a distinct chill, particularly if the abscess be large and the suppuration extensive. When suppuration takes place, in a great majority of

cases, the pus seeks an external opening; usually burrowing through the alveolar process, but sometimes finding its way down by the side of a fang, or through the nerve canal.

But after pus has been formed, it is still possible for the inflammation and suppuration to be arrested, and the pus absorbed without an external opening. In this case the pus corpuscles are necessarily broken down, very probably by a fatty degeneration, and then removed by absorption, after which the parts again return to a condition of health. Tincture of iodine, applied with a camel's hair pencil, stimulates the absorbents and hastens the cure in these cases, which however are rarely met with.

If suppuration, however, has been fully established, there is generally a partial cessation of pain, and indeed sometimes a total cessation, consequent upon the destruction of the sensitive extremities of the nerves themselves; but in many cases the pain continues until the evacuation of the pus relieves the tension and pressure upon the nerves, when it gradually abates. It has been recommended to cut boldly down through mucous membrane, gum, periosteum and alveolar process, to the seat of the disease, and thus abort the abscess at an early stage; but though this might and probably would be successful in the main, still few would be willing to submit to this heroic practice, and it will be absolutely necessary to pursue a milder course. When, however, the abscess has pointed upon the outside of the gum and fluctuation is perceived, no time should then be lost; a free opening should be made with a lancet, after which the pain quickly subsides, the swelling disappears, and after a few days of rest, we proceed with the treatment for the permanent cure of the abscess.

In some cases the pus may be reached without difficulty by an opening through the fangs of the affected tooth, and the necessity of an external opening be avoided.

The severity of the pain during the progress of the disease may be much mitigated by occasional doses of from 30 to 40 grains of chloral hydrate, or by subcutaneous injections of quarter grain doses of morphine.

[*To be continued.*]

Operative and Surgical Dentistry.

ALVEOLAR ABSCESS: ITS PATHOLOGY AND TREATMENT.

Read, by appointment, before the Second District Dental Society of New York, by W. S. Elliott, D. D. S., Goshen, N. Y.

To comprehend fully the pathology and treatment of any given affection, we should extend our observations to the histology of the tissues involved, and endeavor to recognize the ultimate features of that sentient principle which underlies all the phenomena of our being; to grasp, if possible, the plan of normal life-action, and to take hold with our understanding of the peculiar phases of the nutritive function.

The conditions of health are positive; the integrative and disintegrative acts are equally pronounced, and being impelled by inherent forces, constitute that grand physiological element called Life.

The qualitative feature of normal life is EASE. It exhibits itself as the fulfilment of a purpose, and is the highest expression of intelligence. Its office is self-perpetuation and development, and under conditions favorable, such an end is attained.

DISEASE is approximately allied to death; a departure from original design; a perversion of adopted means; but, perhaps better defined as a condition unfavorable to the immediate accomplishment of the ideal purpose. It becomes the negative element in the scheme of our existence, and when these highest purposes are entirely thwarted absolute death becomes the result.

Disease does not, therefore, embrace the theory of something added to or taken from the body, but a modification of that impellant, more especially denominated the VIS VITALIS. Every function is dependent upon a proper balance of the vital forces. The movement of the blood, or other fluids, should not be diminished or accelerated. There should be no undue heat; no discoloration of the tissues; no change of structure, and no evi-

dence of chemical reaction. The presentation of even one of these features, implies a greater or less disturbance of the entire role.

In accelerated motion of the blood, the process of waste is augmented without a corresponding degree of repair; and this arises from the partial failure of the power to assimilate.

The peculiar force to a corresponding degree, is transferred to that which we recognize as chemical affinity, and while this would assert unlimited sway, it is held in partial check by the combined correlated forces. As chemical action, however, predominates, electrical polarity is disturbed, heat is evolved and the mechanical structure is broken up. Every atom of nutritive matter, instead of becoming formed into tissue, is left to abnormal influences, and present themselves in a condition of semi-vitality.

The principle here spoken of is admitted by the best writers upon general pathology, therefore let us be guided by it in our study of that affection which becomes the subject of our paper.

Bearing in mind the anatomy of the maxillæ, including the osseous, muscular, blood and nerve systems, we find the initial point of encroachment of this disease upon the endo or periodonteum, a delicate fibrous membrane lining the pulp cavity of the teeth and the alveoli. This membrane is highly vascular. Innumerable nerve fibrillæ offer a ready conduit to the ganglionic centers. This transmission of influence is favored, since the unyielding parietes of the alveoli prevent an immediate local diffusion of the symptoms.

Abscess is the sequel to inflammatory action. To recount all the early conditions prior to this stage of the disease, would be foreign to our purpose; we have but to recognise the accepted causes and the train of phenomena and pass at once to the consideration of the special affection. It is usually brought to the notice of the practitioner during the period of intolerant pain. The parts are angry and swollen. The system at large is in sympathy and there is evidenced a general disturbance of normal function. But what is this disturbance? In what does it consist? The countenance is flushed and anxiety is depicted on every lineament. The heart's action is exalted; appetite diminished. The dorsum

of the tongue is covered with a brownish secretion; the mucous crypts engorged; and a semi-purulent, pasty substance exudes which is subject to decomposition and which contaminates the breath.

There is throbbing of the temples, an indisposition to quietude, a wild demeanor and exalted apprehensions.

The last mentioned symptom is the first to be met; assure the patient that the aggravated features are but temporary, and proceed at once to treat the other symptoms rather than attempt the removal of the cause. Before the breaking up of the blood corpuscles, and their degeneration into pus, the prognosis is favorable. Remember that the life forces are unbalanced; action is first transferred to or concentrated in the nerves, and in proportion the surrounding tissues are reduced in their power to duly perform their several functions. Their prestige is waning; heat and chemical affinity are attesting their right to dominion, and like the water of a fountain, seek to fill the plain that is lower than itself. Heat is the result of transferred force. It takes precedence of its compeers and is the leader of the fighting hosts. With its banner of the crimson blood, it leads its armies to the very citadel of life. It is valiant—it would be invincible—and is our greatest adversary. With what weapons, then, shall we meet the enemy? Common sense and philosophy teach us to set up an icy barrier, and experience has demonstrated how formidable is the protection. It distracts the invader and thins its ranks. It is virtually throwing cold water upon the fire of inflammation. The blood channels are thus contracted and their contents thrown back upon the main column. Allow no regather of strength. Institute a flank movement—with a saline aperient—and compel the enemy to look well to its rear.

To enhance the efficacy of cold applications, add the tinct. hamamelis; its effect is to modify the action of the nerve fibers and to lessen the sympathy with ganglionic centers. A saturated sol. chlorate potassa to be used *ad libitum* as a mouth wash, and a small quantity to be taken into the stomach, has a favorable effect in the same direction.

But we are, however, only anticipating our real subject. A link farther on in the chain of phenomena, are presented other symptoms; viz., chilliness and a creeping sensation along the spinal column; exquisite soreness of the tooth and throbbing pain.

The chilly sensations are peculiarly indicative of the first formation of pus, which may now, in the presence of the other symptoms, be positively diagnosed.

The power to appropriate nutritive material having failed, the accumulated lymph becomes degenerate, and a sac is formed, which is death's habitat.

This sac is bounded by a fibrinous wall, instituted through physiological action as a barrier to the encroachment of what has at this point become foreign to the economy. Complete antagonism is set up between the living and the dead—the physical forces on the one hand, and the vital on the other.

When we consider that vitality is maintained only under conditions which are approximately normal, it is not to be wondered at that the purely physical will finally predominate and gain in strength in proportion to the conversion of the organic structure into its inorganic elements. From the pyogenic membrane issues the unorganized and unorganizable material, which being subject to still further chemical influences, is converted into expansible gases, which are still farther removed from a condition of intuitive life.

From the consideration of the pathology of this disease, let us refer again to the treatment: If the product of the affected parts is antagonistic to a proper restoration of physiological function, it is evident that it should be removed as quickly as possible. For this purpose an entrance may be made to the sac from whatever point it would seem most convenient; evacuate the contents of the cyst, and return thereto some agent which will check the seeping through from the walls the weak elements, that under the new conditions so readily lose their little remaining vitality. For this purpose, creasote, carbolic acid or chloride zinc, in various states of solution, are recommended. The albuminous secretions are thus seized upon and

immediately converted into insoluble coagulum, shutting back the exudate, and retaining it under circumstances more favorable for organization.

It may be averred that to dwell upon the various theories promulgated relative to cell life and the dynamical features of organized being, would lead us too far into the depths of metaphysical thought, and away from the practical considerations of the subject. The study of Biology is, however, peculiarly fascinating, as it leads the mind to an appreciation of a higher and a finer sense and a recognition of the true soul element.

Grossly practical, however, is the suggestion of an eminent dentist to extract the affected tooth, even though it be a molar, remove the adhering sac and diseased periodonteum, and return it to the alveolus. I fancy that the successes would scarcely compensate for the necessary suffering attending a large proportion of the attempts to re-establish the affected organ.

Another and more advanced phase of alveolar abscess is presented when the bony parietes, through the pressure of the enlarging cyst, or through solution by continuity, are wasted and extension given to the accumulating pus. Under such circumstances there is established a fistula, to which direction is given according to the yielding character of the surroundings. Usually egress is made upon the gum, but often the deep integuments become involved, and an opening made at some point quite distant from the original seat of inflammation. Prior to the discharge of the accumulated matter, treatment may be instituted with the view of arresting the further destruction of tissue. To this end we would follow up, as far as possible, the advancing pus with the lancet—frequently if necessary—until there shall be a complete removal of all that is obnoxious. The cavity then may be syringed with slightly salted water, followed by chloride zinc sol., and time given for nature to institute the process of granulation. Care should be taken not to thwart nature by over medication; she is a good conservator and has proven many a time that the "let alone" treatment is the best.

Mechanical and Miscellaneous Department.

ELECTRICAL PLUGGER.

The following letter from a correspondent, although not designed for publication, we take the liberty of publishing, as a matter of interest to the profession in this age of progress:

PHILADELPHIA, PA., Sept. 1, 1870.

DR. W. H. EAMES:—Dear Sir—A few days ago we received the back Nos. (June, July and August), of the "Journal," and now we consider ourselves thoroughly posted in the news of the dental world to the latest dates. We particularly noticed your article in the June No. on "Labor Saving Machines." We have seen Green's Pneumatic Engine, also Dr. Morrison's Instrument in operation.

Since our return to the East we had the pleasure of attending the semi-annual meeting of the Delaware Dental Association, held at Wilmington, in July, of which we have been a member for several years, and found there our preceptor, Dr. W. G. A. Bonvill, of Dover, who has invented an "Electrical Plugger," which is run by a small battery, requiring no assistant, or additional mechanical movement or power of any kind.

This is what we can truly call an Automatic Plugger. We saw it in practical operation. It makes a steady even blow, and is easily changed to either light or hard, fast or slow. Patients prefer it to the mallet. There is none of that jarring sensation, nor any humming or unpleasant sound, that other instruments of this character seem to have. In fact no noise whatever, except what the battery makes, which being so small is very slight, but this is easily obviated by placing your battery in the cellar, or adjoining room.

The Doctor has also attached to it a "bobbin," (which is quite a novelty,) something similar to the sewing machines, in which your foil, having been cut in narrow strips, is wound upon, or in this bobbin, so that when the plugger is in operation, the foil is carried into the cavity by aid of the point of the instrument, making it a *self-feeder*. By using your foil in this manner, you can complete a filling without even stopping, whether your operation be five minutes or five hours. So we think it might not only be called a "Labor-saver," but a "Time-saver," for to no one is time more valuable than the dentist, and with this plugger a filling can be introduced, we think, in about one-half the time required by others. It certainly, as a plugger, surpasses all others. This is not only our own opinion, but that of all who have seen it in practical operation. * * * *

This can certainly be called filling teeth by lightning! who ever thought of it! The world (dental) still moves. Science and art are advancing, and with them dentistry seems to go hand in hand. It is the latest invention, what will be the next? Let us wait and see. L.

HYDRATE OF CHLORAL.

This very popular remedy for all the ills that flesh and nerves are heir to, has proved itself equally efficient for dental purposes. We have made some experiments with good results.

First Case. — A lady of nervo-bilious temperament, delicate health and subject to severe attacks of heart disease. She had a large distal cavity in a lower bicuspid, that must be filled, but said that she did not think it possible for her to undergo the operation, as she always had a nervous chill whenever she saw a dental chair. We gave her twenty-two grains of chloral in about an ounce of water, and requested her to take a seat in the waiting room. In about half an hour she took the chair without the least dread, and the operation was completed with but little pain or inconvenience. The patient expressed her gratification at the success of the experiment.

SECOND CASE—Lady of nervo-sanguineous temperament, ordinarily very difficult to manage; but under the influence of twenty-five grains of chloral, submitted to the regular routine of wedging, excavating, filling and filing with but little inconvenience.

With the experience we have had we do not hesitate to recommend it to the profession, to meet that class of cases which so often baffle one's best efforts. W. N. M.

THINGS WE SEE.

In the course of a few years dental practice, in this western country, we frequently see things that need ventilating; and belonging to that class who happen to think that a few of these items given to the dental literature of the country, might be conducive to better things, we select a few from our note book, for the "Journal."

First. In October, 1868, we were consulted in reference to a dental operation, that had been performed by an itinerant dentist, but a few weeks previously. We found on the posterior approximal surface of the upper right central incisor, a large cavity, and upon the anterior approximal surface of the lateral incisor of the same side and same jaw, a very large cavity. These cavities had been excavated and filled. In order first to get a good approach he had separated with file and chisel, I suppose. This done, he prepares his gold, arranges his napkins, &c., and proceeds to the filling. Introducing a pellet he drives it down a few times. But the thing is a little contrary and wont stay there. Well, what is to be done? Don't want to waste my gold. Can't afford it. Cost me forty dollars per ounce. Brings up another pellet, drives it down, another, and then commences with the other tooth. Stuffs it in like manner, finally concludes to put some down between the two. This is just to his hand. It holds both securely. In this way he finishes up the work. And in this condition we find the case, with the addition, of course, of a little inflammation.

What think you of this kind of gold plugs? Our own impression is, that the Doctor wanted to make a little gold shine and had not the mechanical skill to do it in any other way. Or else he was afraid the things would not stick without wedging them, as some one else has said. We would advise the Doctor the next time he has just such a case, to use a little Spaldings glue, if he cannot do better.

Another case of more recent date. Young lady, about eighteen years old. Both upper central incisors decayed upon each anterior approximal surface. Excavates and fills both, bridging across from one cavity to the other with os artificiel, telling his patient it is just as good and don't cost as much as gold.

Another. Mr. A. B., late of Ohio, suffers with tooth-ache, applies for relief. The Doctor finds first right lower bicuspid presents upon the posterior approximal surface a large cavity, involving a part of the grinding surface. Excavates and fills with amalgam, crowding down hard upon the gum between the teeth. In a few days we see the case, relieve the man of the amalgam, treat the teeth and dismiss for the present.

We might speak of other cases of a kindred nature that have come under our observation, but these are sufficient.

We ask when shall these things cease to be? How long will an enlightened community tolerate such things. Are we to stand still and look on in silence, because it is thought to be unprofessional to talk about our neighbors? Here is a wrong. Where is the antidote?

Shall we legislate, and educate the people to that point that they may know for themselves when these things are being done?

We firmly believe that when the people understand much more of the minutiæ of the science of dentistry than they now do, that these things will be known as things of the past.

It is not surprising at least, that the people of the West have to a very great extent, concluded that filling teeth is a failure. We hope that when a new order of things takes place all over this western country, that the people will come up with their universal verdict "That filling teeth is a success."

COUNTRY.

KIRKSVILLE, MO.

BIBLIOGRAPHICAL NOTICES.

THOMAS ON NITROUS OXIDE.

This is a neatly bound volume of 120 pages, which has just been issued from the well known establishment of Lippincott, Philadelphia.

It commences with a history of the discovery of nitrous oxide by Priestley, in 1776; relates the experiments of Sir Humphrey Davy, and the discovery of its anæsthetic properties by Horace Wells, &c. gives a minute description of its manufacture, and the apparatus required for its manufacture and use as an anæsthetic. Minute directions for administering the gas are given, and a chapter upon its physiological action, which, however, adds nothing new to our literature upon this subject.

Suggestions in regard to extracting teeth, with cuts of instruments used closes the volume. The book contains much that is well worth reading, and will doubtless prove useful to those who make use of the nitrous oxide. J.

DENTAL INFORMATION FOR THE PEOPLE; By J. W. Green, Chillicothe, Mo.

This book contains 130 pages, and is divided into eighteen chapters. As its title imports, it is intended for general circulation, and contains in simple language much information that should be more generally disseminated.

Our literature has been notably deficient in this kind of reading, and it is to be hoped that more attention will be hereafter paid to this matter of furnishing the masses with information upon subjects connected with the care of the teeth,

We doubt not but that this book will prove of much service to communities in which it is generally circulated. J.

TRANSACTIONS OF THE ILLINOIS STATE DENTAL ASSOCIATION, FOR 1871.

This is a very respectable volume of more than one hundred pages, and reflects much credit upon the Society, which is rapidly taking a prominent position among the most useful and talented Associations of the country.

It contains many papers which bear upon their faces the unmistak-

able evidence of study and investigation, and the discussions as a general thing are well sustained.

Much credit is due to the Secretary who prepared the Proceedings for Publication. J.

THE TEETH AND HOW TO TAKE CARE OF THEM: A Book of Information for the People, by J. W. Lyon, No. 11, Dey Street, New York City.

This is a respectable volume of about thirty pages, intended, as its author shows, to give information to the masses. Dr. Lyon proposes to furnish them for free distribution among the people.

We think the Doctor will make a success of it.

We have looked over the book, and believe its teachings are for the most part *orthodox* and well calculated to do good. J.

CALIFORNIA STATE DENTAL ASSOCIATION.

Proceedings during the First Session, held in San Francisco, June 29, 30, and July 1, 1870. Condensed.

Pursuant to a call issued by the San Francisco Dental Association, the Dentists of the State met in Convention, and were called to order at 10 o'clock, A. M., June 29.

Dr. Knowles was called to the Chair, and Drs. Younger and Myers elected Secretaries.

Dr. Knowles stated the objects of the call, and addressed the Convention as follows:

GENTLEMEN:—In accordance with a call issued by the order of the "San Francisco Dental Association," we have met to form a State Dental Association.

We believe the time has come when associated effort may be of practical advantage to ourselves and to the communities in which we reside. But we are about to try *no new experiment*, as the value of like associations has long since been demonstrated by others, whose footsteps we only follow, and by whose experience we hope to profit.

"Our Golden State," though lacking none of the elements of general enterprise, having already made its mark on the pages of

the world's history, is among the last to acknowledge the practicability and propriety of what we are about to do.

It takes a long time to assimilate the heterogeneous elements of any new community, especially such as ours, drawn, as it is, from every "nation, tongue and people" under heaven, into that homogeneity which gives birth and substance to intelligent and productive association; and not till we outgrow the baser promptings of that blind selfishness which sees only the *present*, "which takes but never gives," and recognise a more generous policy, shall we be prepared to reap the full benefits of binding ourselves together for either social, intellectual or professional improvement.

Removed as we are by location, and until recently by communication, from the older centers of civilization, many of us for years have been left to our own individual resources, and probably have not kept pace with the growth of our profession in more favored communities.

It would be well, perhaps, for a moment, to compare the proud eminence which the Profession now occupies, with that of, say thirty years ago. Instead of being as then, a *mere trade*, a sort of hybrid "between a Veterinary Surgeon and a tinker" with a *little more of the tinker*, at best but a mixture of empiricism, and what would now be justly considered quackery or downright knavery, the profession has now its *systems* of study and instruction, its colleges and professorships, filled by men of social, literary and scientific standing, equal to any profession known among men.

The history of the growth and usefulness of our Profession for the last thirty years, is acknowledged to be without parallel. A European journal speaking of this, says: "The growth of this Profession in usefulness, in both scientific and operative excellence, especially in the United States, is *wonderful*."

What has caused this change? What has liberalized the Profession and made common property what but a few years ago were held as "*secrets*" to be had only for so much money? I have bought and paid for, as "*great secrets*," various receipts for metal dies, solders, methods to prevent the warping of plates,

receipts for the manufacture of teeth, tooth powders and washes, methods of preparing foil, and methods of using it; in fact almost every item of practical knowledge, upon which I did not happen to *blunder* during the first decade of my practice, was bought, and eagerly bought and gladly paid for. I once paid thirty dollars for the receipt of the "arcenious acid and morphine paste," and twenty dollars for the important knowledge that "lapis infernalis," or "hell stone," was sure to render gentle the most high strung of sensitive dentine, and so on to the end of the chapter.

The first full set of teeth *I ever saw*, I made, and the means by which the result was reached were, I assure you, of my own invention. At that time I had never seen an impression cup, (the impression being taken in wax held in the fingers, or the plate fitted to the mouth by bending with hammer and pliers,) but I saw the necessity of some such contrivance, and constructed one of brass and tin plate, which would astonish the present generation of Dentists. It was made to take the impression of both jaws at the same time, filled on both sides with yellow wax and the jaws closed into it. I need not say that this first attempt was not a perfect fit, although double geared with formidable spiral springs. The victim is now dead.

Gum teeth were unknown, and when S. W. Stockton first introduced them they were considered the wonder of the times, 'though compared with the more perfect productions of to-day, they looked like "split beans set up in gingerbread." But all honor to Stockton, he contributed largely to advance this branch of our Profession.

Nitric acid—sulphate of copper—creasote and the hot iron were the approved means of killing the nerves of aching teeth—and sometimes nearly killed the patient. Extracting was usually done with the "key." Flagg's forceps were just coming into use, and Parmley's soon followed.

I well remember my first *horror*—the first blood shed by my hand on the threshold of our Profession. 'Tis more than thirty years ago, and no circumstance of yesterday is more fresh in my memory than that first ordeal of extracting a tooth.

[Dr. Knowles here gave a humorous description of the attempt and failure, and proceeded.]

With another and very determined wrench, with such force as I then thought was sufficient to break every bone in the man's body, I tried to twist the tooth out, when—*crash*—the hook again slipped off, and as ill luck would have it, my foot tripped at the instant, and the instrument, hook, handkerchief and all were forced into the man's pharynx, so completely strangling him that for a few moments visions of homicide, manslaughter or murder floated before my bewildered imagination, and nearly deprived me of volition. Of course I pulled the thing out of his mouth, when, "Wh–what in thunder are yer about; guess yer dont know much 'bout hauling teeth," roused me. I had not killed him. After considerable coaxing I got the instrument on again, and determined, as confidence returned, to have the tooth out. *I got it*, but the expression of that man's face—his protruding eye-balls, suffused with tears, and the cry of agony he uttered at that last and final wrench, have haunted me these long years. I did not charge him any thing.

But, gentlemen, I received as good instruction as most students of those days, with perhaps additional advantage of two years previous reading of general medicine. Six or eight months in the laboratory and at the chair—reading the scanty text books then known, and paying for this instruction from one to five hundred dollars, swearing secrecy to the receipts and processes, and agreeing not to practice within certain limits, was all that was required.

A cheap way to become a Doctor.

How different to-day is all this. The accumulated knowledge of the most advanced among us, is spread before the student and urged upon him. Instead of withholding knowledge, we demand such conditions as to age, capacity and thorough study of both theory and practice, as shall better fit him for his prospective duties than we ourselves were.

Till 1844, I was not aware of any other Dental periodical than "Stockton Dental Intelligence" being published. About this same time the "American Journal of Dental Science,"

came to my hands, and from that time, the press has poured forth its treasures, and met the demands of our growing profession. Text books, since "Bell on the Teeth" and "Fitch's Dental Surgery," and one or two smaller works, constituted my entire library, have multiplied, till to be ignorant of the leading scientific facts of the profession, by even the most rural among us, is simply to be stupid.

The difference between the *now* and *then*, is solely due to association. That friction, which interchange of thought and experience is sure to excite, has built up and made the Profession, what it is to-day, our pride and boast. The Profession on this Coast, although ranking among its members many well educated and most excellent operators, needs this friction of association to develop and make more effective its powers and usefulness.

We need to sink every personal consideration and ambition, which may stand in the way of the freest platform and the most democratic basis of organization. Let all come!

Let the old and experienced in the Profession remember that they have been young and perhaps not overwise—and the young remember that to be wise they must have experience.

We have much to do to get in the way of work, and it will need "prudence, zeal and integrity," to make this proposed Association what it should be, a *bond* that shall unite the Profession in friendship—a spur to the indolent, a beacon star to the studious, a crown to the good and true, but a whip of scorpions to the undeserving.

But, gentlemen, not alone in the scientific departments of the Profession will association benefit us, we have social natures to cultivate. The old saying that "two of a trade can never agree," is too often a truth among us. Many a man seen through the fogs and mists of professional jealousy would upon nearer approach prove to be a "friend and brother."

We suffer professionally by neglecting to cultivate that sociality, which constitutes the true basis of society. To become better acquainted with each other, is generally to better respect each other. How many of the asperities of professional life

might be softened down, or altogether erased by a more genial-tempered intercourse with each other. Instead of the feeling, when we enter the office or presence of a brother professional, that we are to encounter, perhaps, the uncertain perils of treading on forbidden ground, or the terrors of entering the den of some gorgon or other monster—a brother's welcome greets us, or at least a professional and gentlemanly courtesy sets us at rest. I believe man to be better than he is accredited to be. No man lives who is not attuned to a chord, to the *key note* of which grand harmonies may be called out; we have only to find it and use it, to make better any with whom we come in contact. This is the true secret of life's concords as well as discords. Touch these chords rudely and with unskilled hands and harsh jarrings grate along the whole gamut,—but sweep them in their true harmonic relations, and humanity responds in one grand orchestral anthem.

You, gentlemen, prove by your presence that you are interested in the business before us. Others who are not here in person, still in spirit wish us God speed. Others, perhaps, whose attainments so far transcend the ordinary pretensions of the Profession, that they have no need of "more light," stand proudly alone, and view with contempt any acknowledgement by their humble brethren that there is more to learn. Happy men !—the world was made for them.

Progress, gentlemen, is the living password by which to gain admission to higher degrees of professional excellence. He who does not constantly and persistently strive to do better to-day than he did yesterday, will surely retrograde. There is no standing still; go forward or backward, live or die is still the law, and there is no evading it.

Has the profession exhausted all inquiry into the causes, remote and proximate, of the diseases we are called on to treat? Has the last response been given from the temple of Hygeia? Has conservative Surgery accomplished its last and highest triumph? Has the Microscope, the Scalpel and the Crucible no more to reveal? Is *Art* exhausted and all the field of inquiry reaped and their fruits garnered? Then may we sleep!

Gentlemen, we need a college on this coast, and if we have not the necessary talent, among ourselves, we can *import it.* We owe to those who are to take our places, greater facilities for study and professional bread, than the times have afforded us. The future will demand men educated in all that constitutes the scholar and professional man, and refined in all that makes the gentleman.

The tendency of the profession is towards Specialties; ours has become distinct, and we must see that its excellencies are the full measure of its importance. Charlatanism and quackery will not much longer be tolerated. The general intelligence of the people is rapidly increasing, and the general principles of most of the professions are to day better understood by the people than they were by their professors an hundred years ago, and to maintain our pre-eminence, we must "push ahead."

We need a periodical publication, partly as a means of communication among ourselves and the professional world, but mostly as a vehicle of special information and instruction to the people. Never will our profession hold its true place in public estimation, till the people are educated to know their own needs and justly appreciate an intelligent and skillful supply of them. We well know from daily observation in our offices, that general ignorance abounds as to the benefits and demands of our profession, even among those whose general intelligence is unquestionable. A popular Journal issued, say monthly or quarterly, filled with such matters as this state of things demands, would be of incalculable advantage to the people and to the Profession. A microscopical corps devoted especially to dental and cognate inquiry would be of use to us. A Society of the kind already exists in this city, to which the profession could doubtless gain access.

We should also establish a library and cabinet, as educational adjuncts, and to accumulate and preserve for future use such specimens and varieties as are occasionally met with, and which would otherwise be lost.

Professional Fees will probably also demand a share of your attention, and should be approached with caution. "Who steals

my purse, steals trash" may do for an impecunious philosopher, but with most men it is rather "stand and deliver." While I believe our profession is entitled to liberal support, and that the best talent generally commands and receives the largest fees, yet we should not forget that there may be those, whose full souls overflowing with the "milk of human kindness"—whose sole satisfaction in this "vale of tears" is to do good, without thought of self—who, even through the public prints, inform the suffering world of their disinterestedness and desire of selfsacrifice for the benefit of others—who toil early and late, bringing to the altar of their devotion the most transcendent talents, varied and extended experience, and most profound professional attainments and skill—and who contrary to the usual maxims of the world "give, but will not barter their souls." I say such men have lived and may even be among us unrecognized and unappreciated. But I am not one of them.

Many other matters will probably come up during the sittings of this convention, and perhaps none more important than an inquiry into the propriety of obtaining State legislation regulating the practice of Dentistry. I am aware that great diversity of opinion exists on this subject, and it would be well to determine the matters.

There are fields of professional inquiry not yet entered upon, which will yield rich returns to the faithful student, and if those to whom special subjects of inquiry are to be committed, apply themselves diligently, our next yearly meeting may indeed be profitable.

Thus, gentlemen, have I hinted at the work before us. Our future usefulness as an association will greatly depend on the manner in which we commence. Let no subordinate questions sway us from the stern duties we owe to ourselves, and the age in which we live.

Dr. Ball moved the following Preamble and Resolution:

"WHEREAS, it is the opinion of the members of this convention, that it will promote the general good of the profession in this State, to have a State Dental Society, therefore, Resolved,

That we now proceed to the formation of such an organization, and that there be a committee of five chosen, to report a suitable Constitution and By-Laws for the government thereof."

Drs. Ball, Dennis, Menefee, Kingsbury and Jenner, were appointed said committee, who retired to confer. Convention took a recess.

After call to order, the Chairman of Committee reported Constitution,—which declares, among the objects of this association, "To cultivate the science and art of dentistry and cognate sciences," "To elevate and sustain the character of the profession," "To promote mutual inprovement both professional and social."

The officers are a President, three Vice Presidents, a Secretary and Assistant Secretary, Corresponding Secretary, Treasurer and Librarian. Three classes of memberships are provided for—acting, corresponding and honorary. Acting members must be graduates of some dental college, or have been in practice five years.

The constitution was adopted and election of officers ordered, which resulted as follows:—

Dr. C. C. Knowles, of San Francisco, President; Dr. J. J. Menefee, of San Jose, S. W. Dennis, of San Francisco, and Dr. H. H. Pierson, of Sacramento, Vice Presidents; Dr. William J. Younger, of San Francisco, Corresponding Secretary; Dr. H. J. Plomteaux, of Woodland, Recording Secretary; Dr. J. N. Myers, of Stockton, Assistant Recording Secretary; F. A. Park, of San Francisco, Treasurer and Dr. J. Ball, of San Francisco, Librarian.

The organization of the association was then declared complete, and on motion, adjourned to 7½ o'clock, P. M.

EVENING SESSION.

Met as per adjournment.

Committee reported By-Laws, which after consideration were adopted; also reported the following as proper subjects for consideration by the association during its sittings.

I. Operative Dentistry.—1. Extraction of teeth.
2. Plugging teeth—methods and material.
3. Devitalizing nerves in teeth—when indicated, and modes of practice.
4. Alveolar abscess, and treatment.

II. Mechanical Dentistry.—1. Bases for, and methods of mounting artificial dentures.
2. Special consideration of vulcanite—its uses and abuses.

III. Anæsthesis.

IV. Professional Fees.

Adopted.

Dr. ———, moved to amend Art. 1, Sec. 7, of the By-Laws, by adding, "No member of this association shall take a student in dentistry, for a less term than two years." Laid over till next meeting, under rule.

The subject of devitalizing nerves, and subsequent treatment was then considered. Dr. Younger being called on, gave a lengthy, and very clear description of his mode of practice. Uses paste of cobalt, arsenic and sulp. morphine, to devitalize—removes in 24 hours—treats with chloride zinc, tinct. iodine, iodine and creosote; fills point of fang with cotton, steeped in creosote—rest of fang with Hill's stopping or gold—fills crown and pulp cavity with gold.

Dr. Menefee uses dry arsenious acid, and morphia; caps with lead, seals with cotton and sandarac, and removes nerve next day, treats with fluid ext. ergot, and fills with gold.

Dr. Park uses spray when possible, and removes nerve at once and fills; in other cases, applies the arsenious paste as usual, and treats with creosote for a number of days, or till the nerve is so tanned as to allow its removal whole—its legs hanging,—and without difficulty.

Dr. Roberts applies tinct. aconite, erethium and chloroform, equal parts, for ten minutes—removes nerve without pain.

Drs. Sichel and Prather, use rhigoline spray with success, in nearly all cases.

Dr. Ball uses solution of gutta percha on cotton, to seal apex of fang—fills with gold.

Dr. Knowles uses spray when practicable—thinks a surgical

operation better than chemical action—treats with iodine and aconite—does not fill fang point with cotton or swab with creosote; nature protests against its use elsewhere, why not in the teeth?—uses creosote only where nerve has been destroyed by chemical action—fills entirely with gold. Others participated in the discussion, which was very interesting and instructive.

Dr. Knox gave notice, that by request he would illustrate the use of the rubber dam, which was made the special order for to-morrow, at 2 o'clock, Friday.

Subject selected for consideration for morning session, "vulcanite and other bases for artificial dentures."

SECOND DAY—MORNING SESSION.

Dr. Menefee offered the following Preamble and resolution:—

WHEREAS: It has been the custom of persons having Patents for alleged improvements in Mechanical Dentistry, to bring them before the Eastern Dental Associations, for the purpose of advertising the same,

THEREFORE BE IT RESOLVED:— That it is the opinion of this association, that no such subject should form any part of the notice or discussion of this association. Adopted.

There appearing more pressing business before the association, the consideration of vulcanite and other bases was postponed till afternoon session.

Dr. Menefee was called to the Chair, and Dr. Knowles offered the following Resolutions:—

1. RESOLVED, That a Dental College on this Coast is essential to the interests of the Profession.

Referred to Dr. Knowles, Dutch and Menefee.

2. RESOLVED, That it is expedient that a periodical be published under the direction of this Association.

Laid on the table.

3. RESOLVED, That, to elevate the Profession and to protect the community against Charlatanism, State Legislation is necessary.

Adopted.

AFTERNOON SESSION.

The President announced the following Standing Committees as provided by the By-Laws:—

On Arrangements—Drs. Park, Mayers, Plewelling, Willbert, Kingsbury.

On Publication—Drs. Knowles, Plomteaux (ex officio), Younger, Austin, Eaton.

On Scientific Investigation—1st Section—Drs. Knox, Sichel, Crowell.

2d Section—Drs. Paine, Dutch, Roberts.

On Dental Pathology and Surgery—Drs. Menefee, Bunnell, Lundborg, Light, Spencer.

On Mechanical Dentistry—Drs. Cool, Birje, Prather, Coggswell, Jenner.

A communication from Dr. E. K. Jenner in reference to his Patent Combination of Gold and Rubber, in which he offers to the Association its free use for one year, under certain named restrictions, was received and referred to the Committee on Mechanical Dentistry to examine, and report on merits, &c.

The Resolution relating to "Periodical" was taken up and referred to Committee on Publications.

Dr. Park offered the following:

Whereas, the National Association of Dentists holds its annual meeting in Nashville, Tenn., August 2, prox.,

Resolved, that it is expedient that this Association be represented in said body.

Subject of "Bases for Artificial Teeth" taken up.

Dr. Knowles gave history and composition of vulcanite; chemical changes liable to occur under certain circumstances; believes "vulcanite," as a cheap base, superior to any mixture of the base metals, when properly treated. Thinks decomposition complained of to result more directly from imperfect vulcanizing. Uses graduated lamp, and secures uniform results of temperature and time. Time, 2 hours 40 minutes; temperature, 330 degrees. Prefers gold to all other bases. Made the first vulcanite used by himself.

Dr. Younger condemns "Rubber;" believes it injurious in a large majority of cases; has used the English rubber in his practice; has seen the evil effects spoken of in cases of all kinds of rubber; believes it owing to poisonous effects of the mercury in the material.

Dr. Paine had known cases of diseased mouths cured by substituting vulcanite for gold.

Dr. Ball has met with as many cases of diseased mouths where gold was worn as where vulcanite was used.

Dr. Prim further remarked that he had known cases of disease, similar to those referred to by Dr. Younger and others, where no artificial dentures had been worn.

Drs. Menefee, Dennis and Prather did not condemn "vulcanite;" believed the profession could not do without it, under the present order of things. Dr. Prather had seen the ill effects of too deep air chambers; used large shallow chambers.

Drs. Bunnell, Park and Plomteaux placed themselves on record as in favor of vulcanite.

Drs. Crowell, Jenner and Park believed that the trouble complained of arose in a large majority of cases from uncleanliness. Referred to specific cases, and in which the piece had not been removed for seven years—made in England.

The discussion was animated, exhaustive and very interesting, occupying fully two hours.

EVENING SESSION.

Committee on Publication reported on subject of "Periodical" —Resolved, that we recommend that a periodical be published quarterly, under the supervision of the Committee on Publication, and distributed *pro rata* according to the amount subscribed by each member of the Association. Signed by Committee.

[The periodical referred to is designed for a popular vehicle to convey proper information to parents, guardians and the people generally, on matters of special interest to them in the care and treatment of their teeth, &c.]

The matter was recommitted for report at next annual meeting.

The Special Committee on matter of Dental College, reported and recommended the subject be referred to Committee on Dental Literature and Education. So referred, to report at next annual meeting.

Dr. Dennis read an essay on "The Moral of Thoroughness in Dentistry."

A resolution was introduced relating to the use of amalgam, which, owing to some misunderstanding, was postponed indefinitely.

Under suspension of rules, the Society proceeded to elect delegates to the National Association. Drs. Dennis, Paine, Younger, Light and Pierson were selected and declared elected.

Dr. Park offered the following:

Resolved, That our delegates to the National Convention of Dentists, be and are hereby instructed to use their influence to have the next session of said body in San Francisco. Adopted.

The subject of "Alveolar Abscess, Causes and Treatment," was taken up and discussed by Drs. Dennis, Austin, Dutch, Knowles and others.

Nothing particularly new was elicited although the subject was ably treated. Dr. Dutch insisted on the "heroic treatment" of abscess by the scalpel, and referred to a case in his own mouth which had resisted all other treatment. Adjourned to July 1, at 1.30 P. M.

THIRD DAY—AFTERNOON SESSION.

Resolved, That the next communication of this body be held in Sacramento. Lost.

Resolved, That it be held in San Francisco. Adopted.

Dr. Smith introduced a specimen of "McClelland's Rose Pearl" and spoke in its favor. Subject referred to Committee on Mechanical Dentistry.

The hour of special order having arrived, Dr. Knox illustrated his method of using the "Rubber Dam," by applying it to the teeth of a member.

A vote of thanks was tendered Dr. Knox.

Dr. Cool presented specimen of "Cool's Metal," which he

claims as his own invention, consisting of pure tin four parts, and cadmium one part; recommended it for partial inferior plates — was too heavy for other work. Referred to Committee on Mechanical Dentistry to report at next annual meeting.

Dr. Gillespie introduced "Green's Pneumatic Engine," and spoke favorably of its use.

The President announced the following subjects as Theses to be read at the next annual meeting:

On the causes of degeneracy of the teeth, especially among children. Assigned to Dr. Cutler.

On the causes of irregularity of the teeth and best method of correcting the same. Assigned to Dr. Younger.

On the pathology and treatment of Alveolar Abscess. Assigned to Dr. Austin.

On Dentistry — its history, present status, claims and relations. Assigned to Dr. Gillespie.

On Exostosis — history, causes, effects and treatment. Assigned to Dr. Parker.

On professional fees. Assigned to Dr. Ball.

Dr. Bunnell read an Essay on the "History and Progress of the Art of Dentistry."

The Committee on Mechanical Dentistry reported on the specimen and method of mounting teeth on Gold and Vulcanite, presented by Dr. Jenner, and say "they regard it as an improvement, being stronger, cleaner and much neater than the ordinary gold plate work." Report filed.

"Plugging Teeth," was chosen for consideration at the evening session.

Adjourned to 7½ o'clock P. M.

[And on invitation visited the new rooms of Dr. Dutch, where "iced-champagne and sociability," flowed freely. — *Reporter.*]

EVENING SESSION.

Committee on Mechanical Dentistry reported on Dr. Cool's method of lining Vulcanite Plates with Gold or Aluminum, as being worth the attention of the profession.

The members were invited to send any specimen of interest to the profession to the State Librarian, as a commencement of a Dental Museum.

By resolution the Publishing Committee were instructed to furnish an abstract of the proceedings of this Association, to the "Dental Cosmos" and "Missouri Dental Journal" and request a copy for each member.

Resolved, That compensation be allowed Dr. Plomteaux for services as Recording Secretary.

Dr. Plomteaux refused to accept, and a vote of thanks was unanimously tendered him.

Hour of special order having arrived, Dr. Knowles was requested to open the subject.

Dr. Dennis called to the chair.

Dr. Knowles — Did not know exactly what the Association desired, whether he was expected to present the subject in its general or special aspects, or both.

Voice — Give us your own method.

Dr. Knowles — Well, perhaps I know more of that than the methods of others.

Plugging teeth, is by young practitioners thought to be a very simple matter, only "stopping a hole" but "there's the rub;" HOW to do the thing. After more than thirty years constant practice, trying every day to do better than was done yesterday, it is still a problem. Take for instance a posterior proximal cavity in second inferior molar — first "gets at it" by either wedging, cutting with chisels or file, so as to get a clear view with the glass. Opens freely from the top so as to make the cavity compound — uses chisels and gouges of his own make for this purpose. Cuts walls perpendicular from top to bottom with very slight dovetailing, sees that the cervical margin of cavity is formed so as to leave no angles or pits with walls; works on the "parabolic plan" — in no case leaves abrupt angles, or forms "retaining pits." Fills with cylinders or blocks formed by folding soft foil into strips of the width necessary for length of blocks, folds on flat broach, allows first block to be wide enough to completely cover one wall, from above top to bottom of cavity, and

turn a little on cervical wall, pushes home firmly with "bladed pluggers;" treats opposite wall same way — now introduces block sufficiently large to completely cover cervical wall, and "puts it home" with mallet or strong hand pressure. Follows nearly the same process till a mere SLOT is left, which fills with adhesive foil, file and finish. Treats all proximal cavities in molars and bicuspids as compound, never undercuts grinding surface, but plugs SQUARE DOWN towards neck of the tooth. Always uses blades serrated at points; in all cases uses adhesive foil in "cones" or "strips" from the heater; chooses the finest serrations for adhesive foil. Has used "heavy foils;" used pure gold rolled thin more than ten years ago for large cavities in molars. Has had experience in sponge gold, but likes foil better for all cases of contour plugging. Uses cylinders in proximal cavities in front teeth; fills cervical portion first with cylinders large enough to completely cover wall, and uses "flat blocks" to cover lingual wall to apex, which fills with another cylinder, and finishes plugging with strips of adhesive foil, malleted firmly into place. Studies the "divine fitness of things" before beginning to plug, then acts accordingly.

[Many questions were asked and answered during the time of Dr. Knowles' remarks. — *Reporter.*]

Dr. Crossett, a visitor, by invitation addressed the Association, and on motion was declared an honorary member.

A vote of thanks was tendered the President.

On motion, adjourned to first Tuesday in June, 1871, San Francisco, California.

AMERICAN DENTAL CONVENTION.

The sixteenth annual meeting of the American Dental Convention, will be holden on the 20th of September, 1870, at room No. 24, Cooper Institute, in the City of New York, commencing at 10 o'clock, A. M. All dentists in regular practice are eligible to membership.

WILLIAM B. HURD,
Chairman Executive Com.

The Missouri Dental Journal.

A MONTHLY RECORD OF THE SCIENCE.

VOL. II.] OCTOBER, 1870. [No. 10

THE MORAL OF THOROUGHNESS IN DENTISTRY,

Or Filling Teeth.

By S. W. DENNIS, D. D. S., June 30, 1870.

This question has been explored over and over again until it may seem to some that another word cannot be said with profit upon the subject. But notwithstanding all this, as long as dentists exist in whose ranks can be found so many grades of operators, of so many different methods, and so long as the law of the land tolerates, and the public supports and encourages uneducated and indifferent operators, there is ample room for suggestions upon this most important branch of dental science.

After we have instructed those who have confidingly sought our professional services, all within our power, the importance and science of preventing decay in teeth, the next duty we owe to ourselves and our patients, is to instruct them thoroughly upon the best method of arresting their decay. All I shall say upon this subject—should I extend it to many pages with the best combination of words in my power—could be summed up in one word, and that is THOROUGHNESS.

That some are more thorough than others in everything they do, there is no room for doubt. That we shall always have men in our profession of varied theoretical, practical and mechanical ability is equally true. That a man's reward is in proportion to his efforts, his energy and his ambition, is without a doubt in my

mind. If his success is not in the direction he most desires he is notwithstanding rewarded, for what is lost in one direction is made up in another.

Often what appears a misfortune to-day proves a blessing to-morrow. A young lawyer would be false to his birthright, and ungrateful to his Creator, who would throw down his books, lay aside his pen and cease his study because he had concluded that he had not the intellect of a Webster. But let that lawyer study faithfully into all the sciences of his profession, and apply his knowledge with energy and determination, you will eventually find him occupying a high place in the confidence and respect of his competitors and peers. And thus it will be with Dentists, if we wish to succeed we must be thorough in all we attempt to do. "We must strain every nerve and press with vigor on." If we are not able to stand upon the pinnacle of professional fame let us reach high, climb hard, and write our epitaph as highly as possible—if not on the crowning stone—if we cannot be one hundred, let us be ninety-nine.

As to thoroughness, I feel like saying: Blessed is the operator who *always* does his best.

It is hardly possible for a dentist to exercise too much care in anything connected with his profession, and of all things a dentist can least afford to shirk the labor and responsibility of excavating a tooth thoroughly, excavating every vestige of decay and shaping the cavity best suited to accomplish the end, and that is, *a perfect gold filling.*

Now, there is but one exception to this law—as I call it—and that is an exception left only to prove the rule: Where the decay in a tooth extends toward the pulp or nerve cavity, and there is danger of involving its life by removing all the decay, then, not till then, and only then, is it desirable to leave a trace of decay. Every operator who aims at thoroughness in his practice, who examines and fills the tooth of a patient from a conscientious stand-point, finds many obstacles, many rough sticks in his pathway, and nothing but long years of earnest and honest labor will sweep them away.

I suppose there is not a profession or calling in the wide, wide

world, where the temptation is so great, the gates so open, and the fields so large and inviting to empiricism and mountebankery as dentistry. The flowing words of "milk and honey," emblazoned upon the pages of the daily papers: "As good filling for *three* dollars, as other good dentists put in for five," strikes the optic and electrifies the auditory nerve with a peculiar charm.

But it has been said that "this mountebank show is false — it is glossed over with the gold from the pockets of many a worthy and confiding patient, who will pronounce the dictum upon the avariciousness and dishonesty which clutches at their hard earned gains with pretentious assumptions."

We see in some of these show cases, plates and fillings with a beautiful and brilliant polish — you but scrape off the film and the true character of the work is revealed, it may be nothing but brass, the beautiful contour fillings nothing but "sulphate of lime," gilded. And so it is with those mountebanks, you but remove the show, the film, and the true character of the *man* is revealed; "then to those who would eschew this class of operators and would rise above the mediocrity," I would say in the language of the title page of the "Dental Cosmos," "Observe, Compare, Reflect, Record," and "when the opportunity presents itself fall into line with the noble pioneers in rank and file," and march onward and upward, bearing for your motto, "Excelsior, Excelsior."

There is but one line of practice for the conscientious dentist. He must be thorough in all his relations to his patients, notwithstanding the perplexities arising through the demoralizing and corrupting influences of those unworthy dentists upon the people. Though their influence hangs like mill-stones about the necks of the able and honest operators, though they bear down at times with a burden that is almost irresistible, they must stand firmly at the helm that has guided them so far and so safely, — "CONSCIENCE!"

It is the balance wheel of all good governments, and all good men, and he who takes it for his guiding star in the practice of his profession, is as sure to rise and become a bright and shining light as the sun is to shine at meridian, and when he sinks behind

the horizon of his earthly and professional labors to rise no more, it will be said of him: "Well done, thou good and faithful servant," thou hast gone from our view but thy light is still shining. There is nothing more gratifying to a man than to be beloved, or to have confidence put in his word, and there is nothing more humiliating than to find that our confidence has been misplaced.

So the professional man ought to live with these facts fully in view, if he wishes to gain the confidence and respect of the public, so that after he has filled one cavity and charged a fee consistent with the labor and skill bestowed, he can fill another for the same patient and charge four times as much, and the patient will feel that you are only rewarded for your extra labor or pains, because of the difference of the size and intricacy of the cavity.

The contest between merit and demerit in our profession reminds me of that between the Arch and Apostate Angels. It sometimes seems as though the Devil would win, but gentlemen, *virtue* and *skill will win*, will come out triumphant. The public does appreciate the difference between good and bad work. It has to learn. Yes, has to pay for its experience, and *pay dearly*. But when they once learn — when they are once in the hands of a good operator, though they feel at times that his prices are high, they leave him on his high prices with much greater reluctance, than they did the man of low prices, or the man with precepts without practice.

It has been a custom in our profession — as well as others — for "wolves in sheep's clothing" to cultivate the imaginative and tickle the fancy of the penurious element of society, or communities by promises, warrants, or guarantees. But I would most earnestly recommend that people who seek the services of such men — who bite at such worthless baits — should take the warrant in writing and after it is duly signed and sealed, then consign it to the flames, *and go somewhere else*, for such a man in our profession is utterly void of all the requisites necessary to make an honorable practitioner of dentistry.

So, gentlemen, let us now cut loose from the lower grade

of our profession. Let us study hard into the seen and unseen art and science of dentistry. Let us each succeeding day try to climb one step higher upon the ladder of professional knowledge and excellence and ere long we will unconsciously find ourselves above the rugged precipices and bluffs of our professional journey, traveling upon a smooth and luxuriant plain, surrounded by flowers, peace and happiness — and all we want to do.

ALVEOLAR ABSCESS.

[*Continued.*]

We proceed next to a consideration of abscess with fistulous opening, a condition very frequently met with in the practice of every dentist. Three varieties of fistulous abscess are described, each of which requires a separate consideration: 1. When the fistula opens upon the gum nearly opposite the diseased tooth, or upon the outside of the cheek, or it may be that the pus burrows for some distance under the skin, and, perhaps, under fasciæ and muscles, before it finds an exit. 2. Where the pus escapes by the side of the fang. 3. When it escapes through the pulp canal. The first variety covers a great majority of the cases met with, and in different subjects presents many varying characteristics. The most common form exhibits only a single opening for the exit of pus, producing little or no pain, and surrounded by little inflammatory action. The opening is either constantly patent or it is sometimes closed by a thin pellicle of epithelial structure being extended over it, which, as pus accumulates, gives way to the slight pressure, and the accumulated pus having been evacuated it is again closed. If the suppuration is carried on very slowly the covering of the fistula becomes strengthened by the addition of connective tissue, and when the accumulation of pus again necessitates an opening, it is effected only after a considerable amount of pain and inflammation; but when these closures and openings occur at short intervals, little or no pain is felt. In some instances several openings through

the gums are observed in tolerably close proximity to each other, and in such cases there is almost invariably much pain and swelling, the thickening of the periosteum giving rise to a condition which might easily be mistaken for an enlargement of the bone itself. In all of these varieties the inflammation is generally kept up for an indefinite period of time by the irritating substances contained in the pulp canal of the affected tooth. This is evident from the fact that in nearly all cases the complete removal of the contents of the canal, and filling the canal itself with some indestructible material, will suffice to cure the abscess. This is not, however, universally the case, for when the abscess becomes old, and the sac at the apex of the fang fully organized, as well as the walls of the fistula itself, the inflammatory action will sometimes go on after all connection with the pulp cavity has been entirely cut off. The treatment of this variety, so far as its general characteristics are concerned, is pretty generally understood by the reading members of the profession.

The removal of the contents of the pulp canal as completely as possible, and the introduction of creasote or carbolic acid by means of a broach, well annealed, wrapped with cotton, forms the principal part of the treatment. If the patient be placed in such position that the opening from the crown into the root of the tooth is as high, or higher, than the apex of the root, the canal can easily be filled with creasote, and by pressing it with a tuft of cotton on the point of a broach it may be forced through the apicial foramen and through the fistula until it makes its appearance at the external opening upon the gum. When the creasote can be thus forced through the fistula, there is usually but little trouble experienced in effecting a complete cure, but there are cases in which this cannot be done; cases where the canal has become blocked up near the apex, and cannot be opened. I would remark that all efforts to drill through the apex in such cases are apt to be useless, as there is usually a short angle in the fang, and the fine, flexible burrs intended for such service are not only useless in such cases, but there is great danger of the burr being broken off in the canal, which seriously

complicates the treatment. If an attempt is made with a common drill it will in a majority of instances pass through the wall of the canal, instead of following the course of the canal itself, and the final result will usually be the loss of the tooth. If the apex cannot be reached by broaches and finely constructed nerve instruments, it will be better practice to clean out the canal as far towards the apex as possible; treat with creosote thoroughly and plug the canal with gold. If the fistulous opening does not close up treat that from the outside, and in some cases it will be cured. If after persistent efforts in this direction, the abscess still remains, cut down upon the apex of the root, if it be in such position that it can be easily reached, and thus destroy the pyogenic sac, and if needs be excise the apex of the root itself and the abscess may be permanently cured. But there are cases in which it is not practicable to reach the apex of the root and all other methods having been exhausted the tooth is extracted. It is in these cases that it has been recommended to extract the tooth, scrape off the thickened and diseased periosteum near the apex, bathe the root in a diluted solution of carbolic acid, twenty grains to the ounce, and after syringing out the alveolus with the same solution, fill the fang or fangs with gold and replace it. Experiments made in England and reported before the Odontological Society of Great Britain, seem to sustain this practice, and the successes thus far reported are sufficient to warrant us in further experimenting upon those cases that would otherwise be surely sacrificed.

The second variety alluded to, where the pus escapes by the side of the fang, requires some special remarks, the prognosis being less favorable than in either of the other varieties, whilst the third variety, although sometimes slow in getting into proper condition to fill, is, nevertheless, very rarely as obstinate as some cases of the first variety. The treatment by creosote in all cases may cease when there is no fœtor to be observed upon cotton that has remained in the nerve canal from twelve to twenty-four hours.

[*To be continued.*]

MICROSCOPY OF A DECIDUOUS TOOTH, (SUPERIOR CUSPID),

RETAINED AS AN ADULT TOOTH---OSSIFIED CANAL AND TUBULI OF FANG.

By S. P. Cutler, M. D., D. D. S.

This remarkable specimen was given me by a dentist, but had forgotten the circumstances and age of patient. I conclude the patient must have been thirty years of age at least. This tooth was decayed on approximal side — not to nerve cavity — otherwise sound.

The canal had undergone secondary ossification similar to an adult tooth, with all the peculiar characteristics of a similar change in the latter, which happens from advancing age and never by mastication, showing all the peculiarities witnessed in the permanents, differing only in some minor respects.

The fang of this tooth, up half the length, showed that peculiar hyaline appearance or translucency, the result of occlusion of tubuli by ossification, so often met with in teeth of the aged, and from loosening in middle life frequently met with.

In this case we have all the peculiar phenomena characteristic of an adult tooth taking place at a much earlier period than in the adult, as this specimen had not become yellow from time as is the case in advancing age, this tooth retaining its characteristic whiteness of deciduous teeth, except the changed portion of the fang above described.

The nerve canal is about the size of that of an adult of sixty years of age under ordinary circumstances.

There is observed in the secondary formation in the above tooth, the normal outlines of the original nerve cavity, with about the same want of regularity in the secondary formation as in the adult, the original nerve cavity being much larger in proportion to size of tooth.

It is an observed fact that there is a standard proportional size of the nerve cavity in all classes of teeth, that may be taken or regarded as the perfection of development, marking a given or stationary stage, after which time this slow, gradual occlusion-

al process begins and slowly persists in filling up and displacing the pulp, and at the same time more or less the tubular nerve canals, until ultimately the life itself of the tooth is more or less completely driven out.

In the translucent fang spoken of, the tubuli are nearly all completely filled up with earthy salts, leaving it almost transparent and structureless, having a homogeneous appearance, more markedly so at and near the end of the fang.

The more normal dentine of the crown of the tooth and neck portion of the fang presents the usual white appearance, with rather larger tubuli than the adult, the enamel also having the same white appearance.

I have occasionally met with deciduous teeth, more especially upper cuspids, that never loosened and absorbed away, from the fact that the permanent successor did not show any signs of development, the cause why not being readily comprehended. Such sometimes remain in until advanced age, resisting decay where even some of the permanent have decayed. In all such cases no doubt the deciduous undergoes more change than the permanent in its internal structure.

I did not learn whether or not any tooth replaced this one after its extraction. I am inclined to think not, from the fact that I have seen deciduous teeth so retained in the mouth until middle life, and when removed, as a general thing there has been no replacement, though I have seen some exceptions to this rule.

In such cases nature has been prevented from performing her usual task, until the period has passed and the forces in that direction withdrawn, the blood-vessels destined to carry to the point the needed supply of earthy material diminished in capacity, as the bones of the part become more compact and dense; and the period having arrived when only a normal nutritive supply of bone making material is needed in the part, hence the supply necessarily ceases beyond such need and no farther effort made to reproduce such tooth even should the germ of the same be intact. The vital energies directed to that part, also withdrawn after the period proper has been passed for an indefinite time, as

this allotted period had a specific object, that of development and growth.

There may be cases of retention where nature after many years of inaction, resumes her efforts and develops a tooth, when the germinal matter had not been removed by absorption, in many instances giving rise to the belief in third dentition, which may really occur in some instances, though not in the above named.

I have no knowledge of complete tertiary dentition, only partially so. In such cases we have no knowledge ot how this affair is gotten up, whether the germinal matter be provided in youth, or at some subsequent period, or just previous to eruption, making the whole process *a posteriori* movement, nature in the first instance anticipating no such result, it being the result of some accidental circumstance, not *a priori*.

Operative and Surgical Dentistry.

OFFICE JOTTINGS, No. 1.

Under the above caption, I propose to give some expeririences, deductions therefrom, and delineate practical modes of operating in special cases, also the application of the general principles of Oral Surgery. I do not propose to confine myself to that which is new or uncommon, nor to peculiar or difficult cases, but will often take the most ordinary, and always such as really occur in my own practice. Such a style of writing may not be of much interest to the more profoundly educated and experienced class of operators, but is designed more especially for the benefit of the younger members of the profession.

Case I. Mr. S—— brought his two children, a son of eleven, and a daughter of eight, years. The boy was of marked sanguine temperament, and in robust health. His teeth were

large and well formed. The boy was simply a new copy of the father. The temperament of the girl was a mixture of both parents, but more like the mother, who was decidedly *nervous*. The father's teeth have decayed some, but have mostly been preserved by filling. The mother has lost all her teeth by caries. In the girl's mouth were two decayed teeth; the grinding surfaces of the inferior sixth year molars. We will only speak of the left one. The pulp was exposed and giving some pain.

1st. With a grooving chisel and mallet lightly used, we broke down the unsupported edges of enamel, fully exposing the cavity.

2nd. Removed the decay as well as we could without causing much pain.

3d. Introduced a pellet of cotton saturated with carbolic acid, and sealed up the cavity with cotton and Sandarac varnish. Then instructed the patient to call again in two days.

Second sitting.—Patient came to appointment. Tooth had given no further trouble. Excavated as perfectly as possible, but could not remove all decay from about the exposure, without producing intense pain, which could not well be borne by a nervous little girl of 8 years. The exposure was large, and the central part showed the pulp plainly.

Applied carbolic acid until the exposed part turned white. Then applied a little oxy. chl. of zinc to the exposed point, using a small bit of stiff light cloth, large enough to cover the exposure. This produced slight pain, notwithstanding the previous use of carbolic acid. As soon as it was set, the cloth was pulled away and the remaiuder of the cavity filled with Hill's stopping.

The boy's case presented six cavities. But we will now speak of the left superior first molar, which shows a large decay in the grinding surface. The cavity was opened by breaking down the overhanging enamel with the mallet and grooving chisel. Then with an instrument shaped like a hoe, but with a broad and round edge, the decay was trimmed out. As this progressed, it became probable that the pulp would be reached. The dam was immediately applied (any other mode of protection from saliva would answer the purpose), and the excavation resumed, with ease,

always using broad points when there was a possibility of the instrument striking the pulp; for a small point might be thrust through the opening and deep into the pulp by the slightest mischance, and do very serious mischief, while the broad round point may be drawn across the exposure without the possibility of such an occurrence. This mode of excavating was continued until all the decay was removed. The pulp was found to be largely exposed; indeed, in bringing the broad edge across it, the point of the antero-buccal horn was cut away, and the pulp bled freely. A small plate of gold was fitted into the cavity, so as to rest solidly against its walls near the bottom, but leaving a space between it and the exposure.

Some plaster of Paris was then mixed and dipped upon the gold plate, which is laid into the cavity with the plaster down, and gently fixed to its place; then a piece of spunk was placed upon it, to absorb a portion of the water. A little wax was now placed over it and the dam removed, that the patient might rest, and to give time for the plaster to set. The dam being readjusted, the superabundant plaster which had been pressed out above the gold plate was carefully removed, and the walls of the cavity smoothed with suitable burs. Then two pits were drilled in the posterior angles of the cavity, just low enough not to interfere with the capping. The chips and debris are removed by a blast of air. This I obtain by use of the bellows of the spray apparatus, removing the bottle and spray tubes. I catch the rubber tube in my fingers so as to close it, and then pump the air in with the other hand until the rubber ball is swelled sufficiently, when the end of the tube is placed close to the cavity, and the pressure by which it is closed suddenly loosened. This produces a blast strong enough to clear the cavity of all chips and cuttings as completely as the syringe and water. The pits were now filled with strips of No. 60 gold foil, firmly and solidly, and then joined by building across from one to the other. From this foundation the cavity was filled rapidly with blocks of No. 4 gold foil containing a half grain each, building forward over the capping until the anterior wall is reached, then upon this building a surface of No. 60 gold foil. This case might

have been filled by placing a large cylinder on end in the cavity and driving it against the posterior wall and then building forward with the blocks and finishing the same as before; or having started from the pits, the whole cavity might be filled with heavy foil, following the same general plan as with the blocks.

Now why did we use oxy. chlo. zinc in case of the girl, and plaster in the other?

First. In case of the little girl we found it impossible to complete the excavation to our satisfaction. A portion of partially decayed dentine, especially if it be what is termed the white variety, will almost surely promote further decay even though it be thoroughly sealed in with a filling, and especially will it produce an unfavorable influence upon the pulp with which it may be in contact, unless some change in its character be produced which shall render it *fixed* or destroy its power of propagating caries; or, again, of so changing its character that it becomes a permanent substance presenting no changes. Now the oxy. chl. zinc seems to possess this power so long as external influences are perfectly excluded—and it is solely for this effect that we have preferred it in this case. Why not use the same in case of the boy?

First. The decay is all removed, and this peculiar action is not called for.

Second. Oxy. chl. zinc possesses very marked irritating properties, and its effect upon a *healthy* pulp cannot be other than evil, while the plaster of Paris possesses no marked irritating properties, and answers exactly the same purpose of perfect adaptation to the pulp and protection from changes of temperature. The plaster may be mixed with a solution of ten parts of water to one of carbolic acid, in case a slight stimulant to the pulp is wanted. I have been using this compound for almost all cases, for some months. I think it especially serviceable in those cases of nervous or anæmic patients when the vital powers are rather low, but is perhaps not indicated in patients of full habit and sanguine temperament. It is probable that it will answer the same purpose as oxy. chl. zinc upon partially decayed dentine, but I cannot so state from actual practice.

Why protect the cavity from the saliva in case of the boy? In his case the pulp was exposed by excavation, that is, the pulp had not yet been uncovered, although the decay had reached it. The dentine immediately over it was softened and practically disorganized, but not actually broken down, and the pulp had not been exposed to the saliva. Now, saliva is irritating in its nature, and should not be allowed to come in contact with a pulp not previously exposed to it. The same care should be taken with such a pulp as the surgeon would take in a plastic operation about the mouth or face. He will be very cautious not to allow the saliva to overflow the cut surfaces which he wishes to unite by first intention, for the reason that it is prone to excite inflammation. Of course this precaution does not apply to those exposures that have been previously open to the action of the saliva.

G. V. Black.

(*From the Medical Gazette.*)

ENCYSTED TUMORS.

A lecture delivered at Bellevue Hospital Medical College, by Prof. Frank H. Hamilton, M. D.

Ranula; or Encysted Tumors of the Ducts of either the Submaxillary or Sublingual Glands—Syn. Batrachos; Frog-Tongue.—The term ranula, from the Latin *rana*, has by some writers been restricted to obstructions of Wharton's duct, and by others to obstructions of the sublingual ducts. There is sufficient evidence, however, that a tumor answering to the description of a ranula, is found occasionally in the duct of the submaxillary gland, and sometimes, also, in the ducts of the sublingual. Serous cysts may also arise in the substance of either of these glands, probably in their connective tissue, independent of their ducts. Tumors having some points of resemblance to a ranula may originate in obstructed muciperous glands. Finally, there are many examples of enlarged submaxillary bursæ, which very much resemble a ranula in their

external appearance. It is proposed, however, to limit the term to obstructions of the ducts of the submaxillary and sublingual glands. To the other forms of encysted tumors resembling ranula, the term "spurious," may be conveniently applied.

The differential diagnosis between these various forms, is usually attended with so many difficulties, that it seems proper to make a brief allusion to the anatomy and situation of the submaxillary and sublingual glands.

The submaxillary glands are situated below the inferior maxilla, in the anterior portions of submaxillary triangles. They are covered by the integument, the platysma myoides muscles and the deep cervical fascia. The duct of each gland, called the duct of Wharton, commences by numerous radicals, within the substance of the gland, forming a single tube of about two inches in length, and with walls much thinner than those of the parotid duct, terminating in a narrow orifice on the summit of a small papilla at the side of the frænum linguæ.

The sublingual glands, weighing usually about one drachm, are situated beneath the mucous membrane of the floor of the mouth, on each side of the frænum linguæ, reaching from the anterior margin of the submaxillary gland to the symphysis mentis. Their ducts, of which there are from eighteen to twenty for each gland, open into the mouth on the elevated crests of mucous membrane, caused by the projections of the glands on each side of the frænum.

While in some cases an exact differential diagnosis may be impossible, it is not difficult in many examples of tumors presenting the general appearance of ranula to determine the organ or structure to which they belong.

An obstructed submaxillary duct, in case the obstruction is at or near its origin, forms an ovoid, elastic, translucent swelling, first noticed beneath the tongue on one side of the frænum; and it does not press downward and give to the throat the peculiar fullness below the chin from which its name ranula is derived, until it has attained considerable size. Usually such tumors are not seen of a size larger than an almond; but in a few instances they have been known to enlarge to such a volume as to threaten

suffocation. When opened, they are found to contain a perfectly clear, albuminous fluid, of the consistence of the white of an egg, with an alkaline reaction. They sometimes contain solid, phosphatic concretions; and in such cases the presence of these bodies may be recognized by the peculiar feel before the sac is opened.

When these tumors attain considerable size, they involve sometimes the whole length of Wharton's duct, including the canals leading into the gland; under which circumstances the gland occasionally undergoes absorption, in consequence of the pressure; and the tumor ceases to enlarge.

Obstructions of the sublingual ducts give rise to similar tumors, commencing first within the mouth, and subsequently pressing downwards, causing in some cases also, atrophy of the gland, and a consequent arrest of the growth of the tumor. The fluid found in the sublingual ducts differs from that secreted by the submaxillary gland only in being a little more viscid; but Rokitansky affirms that calculi occur in these ducts much more often than in the submaxillary. They are usually white and friable, varying in form and in size from a millet seed to a hazel nut.

Of both these forms of tumors there may be presented rare and exceptional examples, in which the obstruction taking place remote from the orifice, and perhaps near the glands, the pellucid oval projection beneath the tongue does not occur; but from an early period there is quite as much prominence caused by the tumor below the chin as in the floor of the mouth. When the tumor commences in the ducts within the gland itself, as I have seen happen several times, the floor of the mouth is only encroached upon at a late period. But their anatomical character may still be determined by the position of the tumors, and their previous history. I have sometimes been able to determine whether the ducts of Wharton were involved, by a careful examination of the orifices of the ducts, and by the salivary jet.

Those tumors which result from obstruction of the muciperous glands, are now circular in form, and probably never attain much size, or press downwards, into the neck. They contain

an abundance of epithelial cells, degenerated epithelium, oil cells, and granulation cells, giving to the contents the consistence of oil or of putty. They are opaque, although covered only by mucous membrane, and in this regard differ from the two forms before mentioned.

Tumors formed from the connective tissue in this region are not translucent. They lie usually more deeply, and contain serum only, very slightly colored, and probably some phosphates or calcareous concretions.

Finally, tumors occasioned by enlargement of bursæ, lie deeper from the floor of the mouth, projecting less into its cavity, and much more below the chin. They contain a clear serum, or serum colored by more or less blood corpuscles. These are sometimes congenital.

It may be proper to call attention again to the fact, that I have enumerated two forms of true ranula; one in which the obstruction of the duct takes place at or near its orifice, and which is characterized by the translucent sublingual tumors, accompanied with more or less projection below the chin; and a second, in which the obstruction occurs at or near the gland, and there is no sublingual translucent tumor, but only a general uplifting of the floor of the mouth, and much greater prominence of the tumor below the chin.

There is also a third condition to which I called attention in a communication made to the *Gazette* in February, 1868, in which the obstruction occurring in any portion of the duct, is partial and temporary, and does not occasion, properly speaking, an encysted tumor, but a sudden dilatation of all the radicals situated within the gland, causing the gland to enlarge, especially during the act of mastication. In such cases, as in one example cited, an active cathartic may accomplish relief; or the fluid may be expressed by pressure upon the gland. If, however, the obstruction is continued a sufficient length of time, the walls of the ducts yield at one point or other, and a cyst is formed.

Treatment.—The treatment of that form of true ranula caused by obstructions at or near the orifice of the ducts, con-

sists in opening the sac, evacuating its contents, and maintaining or re-establishing the orifice.

It has been observed that the fistulous orifice thus made, cannot always be maintained if the sac is simply incised; but that it is often necessary to remove a large portion of the sac, so as to prevent the edges from falling into contact; and that a successful result is more certainly ensured by cauterizing the edges and interior of the sac, and then laying a bit of lint between the edges of the wound.

In case the obstruction is at or near the gland and the substance of the gland itself is involved in the tumor, as may be indicated by the fact that the tumor does not present the usual translucent appearance under the tongue, but seems to lie deep under the floor of the mouth, projecting chiefly beneath the chin, between it and the hyoid bone, then it will be more prudent to open the sac from the most salient point below the chin; and after the lapse of several days, when the sac has been thoroughly drained, to seek to destroy its secreting surface by injections of tincture of iodine, tents, etc. Opening the sac from the mouth under these circumstances, is attended with the hazard of hæmorrhage; and as it must be kept open a long time, it is exceedingly annoying to the patient; it is more difficult to maintain the fistulous orifice; and finally, it is not so likely to result in a complete obliteration of both the duct and the gland, which must be now the chief point to be attained.

Moreover, it is the form of ranula which is most likely to be confounded with simple serous cysts developed in the substance of the gland, or in the connective tissue adjacent, or with bursal tumors, in either of which latter cases complete destruction of the secreting surfaces and not the re-establishment of the original canal, is to be desired. The destruction of the cyst can be accomplished with the most certainty, through an external, free, and depending opening.

It is true, however, that in the case of simple cysts, here as elsewhere, it is preferable to remove the cyst entire by dissection; but the difficulty in any case of making an accurate diagnosis and the embarrassments which often attend the destruction of

encysted tumors in this region, will justify the surgeon generally in resorting to incision rather than excision.

Finally, the treatment of these various tumors, including ranula properly so called, and spurious ranula, may be summed up as follows:

In case of a well characterized translucent ranula, presenting itself almost exclusively within the mouth, an attempt must be made to re-establish the opening of the duct by free excision of the projecting portions.

In case of a deep-seated ranula, probably involving the gland, it is more prudent to open from the integument; and success is more certainly ensured by continual suppuration, causing thereby a destruction of both the duct and the remnant of the gland itself.

In case of a bursa, the same course should be pursued as in the deep-seated ranula.

And while in case of a simple serous cyst, formed either in the gland or the adjacent connective tissue, if the diagnosis were complete it might be proper to attempt its extirpation by dissection; yet considering the difficulty of diagnosis, the hazards and difficulties of the operation, and the generally successful results of incision followed by injections, the latter course must generally commend itself to the prudent surgeon; that is to say, the same treatment as for a deep-seated ranula, or a bursa.

Encysted Tumors of the Parotid Gland and of its Ducts.— The parotid gland, situated upon the side of the face in front of the ear, is the largest of all the salivary glands. Its excretory duct originates by numerous radicles, which unite within the substance of the gland to form a common duct, called the duct of Steno, which passes almost directly forwards over the masseter, penetrating the buccinator, and after coursing a short distance between the buccinator and mucous membrane, enters the buccal cavity opposite the second molar of the upper jaw. Its walls are dense, consisting of an outer, or fibrous coat, containing contractile fibres, and an inner or mucous coat, lined with columnar epithelium. The canal is about the size of a crow quill.

The secretion of the parotid is clear and watery in appearance, has a mucilaginous feel, is alkaline in its reaction, and, among other ingredients, contains always a compound of sulphocyanogen.

Obstructions of the duct of Steno have not hitherto been classified as tumors; and probably for the reason that they cannot in any case be subjected properly to the same treatment which is applicable to other tumors—that is to say, they can never be properly treated by extirpation—the only proper surgical expedient is to attempt to re-establish the communication with the buccal cavity; but the same objections will hold good against recognizing obstruction of the ducts of the submaxillary and of the sublingual glands as tumors. I prefer to consider these obstructions in this connexion.

Obstruction of the Duct of Steno at its Orifice.—Occasionally as the result of abrasion and consequent adhesion of the mucous membrane, at the point where the duct opens into the mouth, a small pellucid tumor is formed under the mucous lining, which, after a time, opens spontaneously, and a cure is effected.

Obstructions of the Duct of Steno in its continuity, from Adhesions caused by Wounds, Ulcerations, Gangrene, etc., causing in some cases a temporary, elastic, oblong elevation, on the side of the face; but the saliva soon makes a way for itself, through the unsound tissues, and causes a fistula upon the side of the face, which is exceedingly difficult to close. There is, perhaps, no better plan than to pass a pretty large silk seton through the orifice of the fistula into the mouth, tying its two ends upon the chin; after the lapse of two or three weeks, it may be removed, and the fistula closed externally, by freshening its edges and uniting them with silver sutures.

Encysted Tumors from Calculi in the Duct of Steno.—These tumors present themselves as hard, oblong nodules on the inside of the mouth; the presence of the calculus having sometimes caused inflammation and adhesion of the walls of the duct, so that the sac contains saliva and pus as well as the calculus.

These calculi are generally composed of the phosphate of lime, with a triple phosphate.

They must be laid open and the calculus removed from the inside of the mouth, so as to avoid a salivary fistula.

Encysted Tumors caused by Obstructions of the Ducts of the Labial, Buccal, Lingual, Pharyngeal Glands, and Follicles of the Mouth. — *Anatomy of the Glands.* — The labial, belonging also to the system of salivary glands, are situated beneath the mucous membrane covering the orifice of the mouth, and especially the inner surface of the lips.

They are rounded in form, and of about the size of a small pea, opening by minute orifices upon the surface of the mucous membrane.

The buccal glands, similar to the labial, but smaller, are situated between the mucous membrane and buccinator muscle, except two or three called molar glands, which lie between the masseter and buccinator; these latter are somewhat larger than the submucous buccal glands, and their ducts open opposite the last molar tooth.

There are also a few small glands of the same character under the mucous membrane of the posterior half of the hard palate; those of the under surface of the soft palate are larger and more numerous.

Those of the tongue (lingual) are chiefly on the posterior third of the dorsum, and a few are found along its edges, and at the tip.

In the pharynx, especially at its upper part, these glands are numerous.

In addition, the mucous membrane of the mouth is supplied with numerous simple and compound mucous follicles; they extend over the entire surface of the tongue, but are most numerous at the posterior portion.

The tonsil, situated between the two pillars of the soft palate, is composed of lacunæ and closed vesicles, embedded in connective tissues and vessels. The secretion is a viscid mucus, designed to lubricate the food in its passage through the fauces.

Diagnosis and Treatment. — Encysted tumors of the labial glands are of frequent occurrence, presenting themselves as

small, round, vesicular elevations, with semi opaque walls, seldom attaining a greater size than a small pea, and containing a thin transparent, or nearly transparent muculent fluid.

They are often ruptured spontaneously, but in that case they generally reappear very soon.

Simple puncture and evacuation of the contents is generally followed by the same result.

Excision is therefore the only reliable resource. This may be practiced by seizing the vesicle, with a small portion of the adjacent tissues, and excising the whole with a pair of scissors. In some cases I have found it necessary to remove the entire gland, the removal of the expanded duct being followed by a renewal of the cyst.

Very recently I have had occasion to remove a cyst formed in one of the buccal glands; but the remaining muciperous glands of the mouth and pharynx, seldom become sufficiently obstructed to cause tumors; or if they occur, it is probable that their walls easily give way, and a spontaneous cure is effected.

When they occur upon the tongue, as happens now and then, especially near the middle of the dorsum, it is not advisable to attempt their extirpation. A case was reported very recently in which an operation made for the removal of an encysted tumor of the tongue proved fatal. They should be treated by incision and injection. Indeed this observation applies to all simple encysted tumors which may form in the mouth, and remote from the orifice.

Mechanical and Miscellaneous Department.

PORCELAIN VS. OTHER MATERIALS.

Some plain Talk and Facts concerning Porcelain as a base for Artificial Teeth, and in contrast with other Materials.

The intelligent public of to-day readily admits the importance of Artificial Teeth, but the bearings upon health and comfort of different bases for the same, are not so generally appreciated. Thus, for instance, while the public has, for some time, been apparently satisfied with rubber as a base, the profession sees in it most serious objections; and thus, too, does it evidently become the duty of the latter to sound the alarm in all such cases.

But, unfortunately, "the profession has been exceedingly slow in arriving at adverse conclusions concerning rubber, inasmuch as a great majority are bound by pecuniary considerations to uphold it," and especially as there is no satisfactory substitute at hand, even if a change were determined upon. In fact, the profession at large seems utterly adrift on this important matter, and gives sufficient evidence of its wants by ever and anon crying out for something better.

In this dilemma, attention would be called to a style of work fully demonstrated to be superior, though, as yet, somewhat confined in its working, owing to fancied, or real difficulties attending the same. In a word, the plain position would be taken, that while serious objections exist, and are admitted on all hands, in regard to every style of artificial dentures in general use, yet there is a style against which such objections do not exist, but which, on the contrary, stands as pre-eminently above all others, as it does peculiarly alone, in being the only one wherein the plate is of the same material with the tooth, and that of compact porcelain, as pure as a crystal of quartz itself, and as absolutely unchangeable. Thus, it would scarcely be begging

the question to claim at the outset as self evident that this style of work stands, and must ever stand, unrivalled in the essential requisites of a perfect artificial denture, as consisting in unity, purity and inert character of material, and beauty, cleanliness, and strength of structure. Nothing is, or can be urged against it, when properly made, the only objection being with dentists, and that in the difficulty of making.

And just here it may be reasonably claimed, that the important office to be performed by an artificial denture, and the demands for perfection in the same, warrant the dentist's laborious and best efforts in its construction, and that sooner or later the public will appreciate such efforts. Certain it is, with this appreciation comes a demand for porcelain; and as it can now be had of a few dentists, the increasing demand must soon be regarded by the profession generally, or it will suffer in turn with the public—from which it now withholds its best efforts, only because more work, and less pay, comparatively, attends the same.

As far as this matter of working porcelain, with the profession, is concerned, it is simply claimed that, notwithstanding the apparent difficulties attending it, *it yet promises better than anything else possibly can*, inasmuch as not possibly can anything better be hoped for than an artificial denture composed of one material throughout; and no better material can be desired than that already used in the mineral tooth itself, and with which every denture must start out.

But we may be anticipating. We have asserted, first, that the profession is dissatisfied with the different styles of artificial dentures in general use; and this position, sustained, shall be claimed as sufficient ground for the acceptance of something else, against which such dissatisfaction does not, or cannot, exist.

That the profession has always admitted the general inadaption of gold, and the objections to combining different materials in the construction of artificial dentures, is not only evident, as intimated, from its constant cry for something better, but is particularly so from its having at last *eagerly and universally*

accepted rubber as such, with all the defects now admitted against it. And, to be brief, it may be sufficient, in proof of the dissatisfaction claimed to exist with the usual styles of work, to show these defects admitted against *the one which thus supplanted them all;* at least, to show *the most popular work ever in use* to be *positively unpopular*, shall be deemed sufficient. Neither shall it be thought best to encumber with the much evidence accumulated against rubber, but rather trust the less, from the best possible source.

The following extracts, from dental literature and discussions, are selected as reflecting *the general feeling* of our best dentists concerning rubber. And we do not remember a single dental writer now risking his reputation by taking issue with them.

From Prof. Samuel R. Percy, of New York:

"The hard rubber used for teeth base is composed of rubber, sulphur and sulphide of mercury, nearly one-third of the whole being the last named. This amount of mercury kept constantly in the mouth cannot but be sometimes injurious, as it is soluble in the saliva. In addition to the danger of salivation from the mercury of these plates, there are other dangers unknown to the manufacturer. The sulphide of mercury is often adulterated with red lead and bi-sulphide of arsenic—both of which poisons are soluble in the mouth."

From the *Dental Office and Laboratory.* Correspondence by Dr. McGeorge:

"A simple experiment will satisfy any one that rubber contains 30 per cent. of mercury. Burn a piece of it and collect the fumes upon glass; then with a piece of cotton (wet with nitric acid) rub the oxide from the glass, and rub this cotton on brass or copper, and you will have metallic mercury. I need not cite the many cases where people have been hurried to their graves by wearing poisonous rubber plates. We make no more now, and exchange those our patients have, with every evidence of improvement."

From B. Wood, M. D., D. D. S., on "The renouncing of rubber by the dental profession." Dental Register, October, 1869, p. 422:

"Looking at the question, 'what ought the profession to do in the premises?' the light before us reveals no better escape from the difficulties that beset us, than to renounce the use of rubber. Rubber is less durable than metal plates, is more liable to accident, and not so readily repaired without injury, being weakened by vulcanizing until, after a few times, it becomes worthless; it undergoes softening and slow decomposition in the mouth, and becomes porous on its surface, if not throughout its structure, leaving cracks and fissures, consequently imbibes the secretions of the mouth, and is rendered offensive, polluting the food we eat and the air we breathe. Also, whether from injurious effects of mercury eliminated, or other causes, it frequently induces a diseased condition of the mouth, and even impairs the general health. These ought to suffice to induce professional men, who consult the good of their patients, to reject rubber altogether."

From Prof. Taft, editor *Dental Register:*

"Many of us do not hesitate to place rubber plates on the gums and allow them to be worn, though irritation may take place. Any thing that will injure or disease the mucous membrane should be discarded. This is one of the great objections to rubber plates, or plates that are non-conductors, as I believe the difficulty just referred to is dependent upon the non-conducting properties of the material."

From Dr. C. R. Butler—*Dental Register*, January, 1870; p. 26:

"Rubber has done more mischief than any other substance that has been tried in the mouth, and it would seem that simply its abandonment was the remedy."

From the *Dental Register*, January, 1870—editorial:

"We are often asked if we think the Vulcanite Company will try to enforce the claims of the Cumming's patent, after the expiration of the Goodyear. The profession will not be so stupid as to need the rubber by that time, and we hope not so unprincipled as to use a material so objectionable, now that its bad properties are becoming understood. A well posted dentist could

not afford to pay fifteen cents for an office-right for the full term of both patents."

From the report of a committee appointed by the Ohio State Dental Society, 1870:

"The report condemned the use of vulcanized rubber, on account of its injurious effects. Dr. Herriott thought the reasons given in the preamble sufficient to show that the resolution should be adopted. He had in his mind two cases of ptyalism produced from the use of rubber plates. It may, perhaps, be produced also by other causes, but he was sufficiently satisfied of the injurious effects of rubber to say that its use should be condemned."

(The resolution was not adopted.)

From Dr. Berry, in a discussion on Mechanical Dentistry—*Dental Register*—January, 1869; p. 28:

"I have been for years anxiously hoping we should get something that would deliver us from the intolerable nuisance of rubber. But for rubber we should not have been annoyed by these charlatans, nor the people cursed by them. It is strange that every member of the community does not understand that, when a dental practitioner offers his services for almost nothing, he is the best judge of their value; and that, of artificial teeth, the best that can be had are none too good."

From Dr. J. P. H. Brown. *Dental Register*, May, 1868; p. 188:

"Rubber work (offensively odorous), after being worn a short time, absorbs and retains so many different matters and odors that the nerves of taste become blunted and confounded by the heterogeneous mass of filth, so that it is impossible for them to distinguish correctly different tastes. * * * Rubber plates are more difficult to keep clean than any other. The mucus and foreign matter seem to have a peculiar attraction for them, and adhere so tightly that soap and a brush are not always sufficient to remove them. In such cases it is not uncommon to hear complaints of loss of taste."

From Dr. C. B. Knowlton, in a communication on rubber, addressed to the *Dental Office and Laboratory:*

"I read in your last *Dental Quarterly* a report of three cases of mercurial poisoning from wearing rubber plates. * * * For the past five or six years I have been closely watching the effects of rubber plates in the mouths of different persons, and will mention some of the effects upon the lining membrane of the mouth, saying nothing about other considerations. * * * This rubber question is not confined to dentists. Intelligent men and women begin to see that there is something wrong about it. They know not what it is until told of its composition, when many of them will have nothing to do with it. Let intelligent and honest dentists place this matter fully and fairly before the public — entirely ignore the use of it — and they will be sustained. And, finally, rubber for plates is a vile, poisonous compound, which experience fully demonstrates."

These extracts could be continued *ad infinitum* — but we desist. Special attention would be called, however, to an article on rubber, by Prof. Judd, in the October number of the Missouri Dental Journal for 1869.

From the foregoing, the conclusion is inevitable that *rubber is a miserable failure;* and it is also fairly inferrable that the other materials, which it supplanted, never filled the bill, though any or all of them may have served a purpose in individual cases. It is surprising, after all, what objections rest even against gold — in favor of which there is a prejudice as if it were some medical specific. Aside from the well known general objections to metals, there is a serious one in an obscure galvanic or other action, peculiarly wearing upon the health and nervous system of many individual patients, as has been fully demonstrated by substituting porcelain for other plates in such cases.

Notwithstanding the axiomatic character of the remarks already made for porcelain, it might be desirable to add to them, from the great amount of testimony at hand; but we will only call attention to the sanction and encomium given it by the *American Dental Association* of 1868, through its committee on Mechanical Dentistry; and to the same given it by the Ohio State Dental Society, through a special "committee, to whom

was referred the merits of porcelain work, manufactured and recently improved by Dr. W. E. Dunn," etc., etc.

Thus, it is believed the respective positions taken have been sufficiently sustained; but if any feel that the claim of superiority for *porcelain* has not been, it is further suggested that a personal experience will convince the most obstinate.

ONE WHO KNOWS.

THE RUBBER DAM.

New York, July 24, 1870.

GEO. H. CUSHING:

Dear Sir: — Yours of the 19th inst., is at hand. Dr. Barnum will be absent from the city, for two or three weeks. I hasten to reply on his behalf.

Dr. Barnum entered my office as a student, about the year 1858. He remained with me four years, and then went to practice in the village of Monticello, Sullivan county, New York. He continued in that place for the next two years, and it was during the latter part of his stay there that the "wonderful dam" was first used in the drying process. As he promises, ere long, to give the profession a detailed account of the worriments and trials through which the "dam" was elaborated, I will not specify any of them here.

On the 13th day of May, 1864, Dr. Barnum returned to New York as my professional assistant, and immediately on his arrival, informed me that "he had discovered a means whereby dental cavities — no matter how wet their localities — could be kept perfectly dry without the aid of napkins, tongue holders, saliva pumps, duct compressors, or any other appliance then used for that purpose." Had I not known him to be a man most reliable in his ways and words, I should have decided that the *statement*, at least, was *crazy*. But his earnest declaration assured me of its truth and I eagerly demanded to see the "dryer."

On the 27th of the same month the first dental operation in New York by the aid of "Rubber Dam," was performed by

myself on the teeth of Mrs. Geo. D. Crafin. Let me tell you the circumstances under which this early test took place. The lady, for whom the work was done, had been in my chair about two weeks previously, to have some cervical cavities filled in the superior incisors. The cavities occupied the spaces extending from, and impinging upon the upper borders of enamel to and well under the edges of inflamed and bleeding gums. Exceedingly nervous and sensitive, when applied to the patient and the parts involved, but feebly describes the situation. I trust my description is intelligible.

A difficulty had appeared, too trying to be overcome by any agency within my ken. I was completely defeated in all my efforts and sent the patient home for the "healing of her gums" —but I had not the least hope of success in any future attempt. In a few days I was expected to make another trial and I felt that it would indeed be a trial, and — nothing more! The crisis was upon me! Dr. Barnum appeared at the opportune moment, and presto, what a change! When the lady came, and was seated in my chair, four little holes were cut in the Rubber Dam, which was dexterously applied to the four front teeth, and then the *greatest dental discovery of the nineteenth century* — for the profession and the people — *was shown to be an accomplished fact.* The impossible, the vexatious, the discouraging had been overcome, and I was master of the situation. It was all easy and certain then, and the work, thus aided,

"Gave the full measure of content."

I felt, and knew myself twice the dentist I had been before.

Trusting not to weary by too long a recital, I shall now confine myself more closely to the main question. Shortly after the Dam was proved to be a veritable success, Dr. Barnum, with most commendable generosity, encouraged no doubt by the spirit then prevailing among members of our excellent dental societies, desired me to present the discovery as his free gift to the profession. Too modest to do it himself, the honor and privilege of making the offering were devolved upon me.

At a meeting of the New York Dental Society, held in the

Cooper Institute, about the latter part of June, 1864, — some forty members being present, I took occasion to remark as follows:

Mr. President: — There are so many good things constantly turning up and coming to the light, in these days of dental progress, that I am continually elated and exuberant with the satisfaction they afford. The blessedness of living to this day and in these times is cause, to me, for great rejoicing. These expressions are merely preliminary to the enunciation of something at present on my mind, and which shall be forthcoming if I find it timely and appropriate. I shall now propound a question to this Society — to all its members individually and collectively — and I ask that it may receive a serious and candid reply: "Is there any member of this Society now hearing my voice, who knows or has heard of any means or appliance by which he can keep dental cavities perfectly dry for any length of time, and in any, even the wettest part of the mouth, without the aid of napkins, tongue holders, saliva pumps, duct compressors, etc., etc?"

Several negative responses were heard from various parts of the room. "It's hardly worth while asking," "I guess not," "What a question," "It can't be," "I'd like to see it," "Impossible." There was no affirmative reply — no claim made by any one — to my question, and the inference was plain and unmistakable that the "great discovery" was, to them, unknown.

Again I put the question, with the same result as before, and added: "The appliance, of which I have spoken, is actually known, and has been in use; it will do all that I have asserted, and in the name of Dr. S. C. Barnum, its discoverer, I am authorized to present it a free gift to our profession. You have failed to prefer any claim of knowledge in this matter. It's about to be revealed to you, and the generosity of the donor should entitle him, at least to all the honors. If any one has aught to say, let him say it now or hereafter hold his peace. The discovery I now offer, and which will work as great a revolution in operative dentistry, as the use of steam in the science

of propulsion—is *Sheet Rubber*, and will be known hereafter as "Barnum's Rubber Dam."

It was out. The means for the accomplishment of great results were fairly set forth; and what was the effect on those who heard it? Not a joyous hurrah! a perfect bless God! or a thank you, Barnum! was heard in that whole assembly! Instead of these, the words of deprecation and protest were heard:—"It may possibly do in some cases," "It will be more bother than profit," "I doubt whether it will be much used," "It can't be generally employed."

I had been addressing some of the most intelligent dentists of our time, and in the language of Scripture, "they had ears to hear, but heard not; eyes to see they had, but were blind." For sweet charity's sake, I forgive them that cold reception of a gift that should have been hailed with vivas and rejoicing.

It was a long time before even a few of the profession could see anything in the Rubber Dam worthy of approval, and some of them after giving it a trial pronounced it a humbug and a failure. But filled with enthusiasm for the dissemination of so great a blessing, I rallied, at subsequent meetings, again and again to the charge, until the crust of fossilized ideas was broken, and an impression created that can never be effaced. Verily the "Rubber Dam" hath a mission and gloriously will it be fulfilled.

To myself—annoyed and worried as I had been so many years by the inroads of saliva—it came like the pleasant sunshine of relief; like the fruition of fond and earnest hopes; like the culmination in victory of a grand and heroic effort.

Barnum's Rubber Dam—I have not words aptly to express its worth. It is the very best aid to the highest professional achievement, and not only we of the present, may rejoice in its possession, but untold future generations will have abundant cause to call its author blessed.

Truly yours,

J. W. Clowes.

P. S. Dr. Barnum deserves well of the profession. Let them do their best and they can never return him a tithe of the

good they have received. He has discovered the means to essentially aid them in their difficult work. If his gift is appreciated—if there are any who feel thankful that they are permitted to enjoy it, they may if they like appropriately show it by purchasing their supplies of him. It will be as well his pleasure as his ambition to furnish the best. As soon as practicable ample directions for using this Dam will accompany each purchase. J. W. C.

GOLD PLATES WITH RUBBER ATTACHMENTS.

Among the many different styles of artificial work at the present day, there is none, perhaps, which for beauty, strength and cleanliness, excels what is known to the profession as combination work: a gold base with teeth attached by means of rubber. This style of work, when neatly executed, and so constructed as to hide perfectly the means of attaching the teeth, will rank among the finest specimens of dental art. We will endeavor to describe three methods of constructing this style of work, suggested by different operators.

CASE.—A full upper denture. The plate is struck up and fitted in the usual manner. The teeth (in blocks or sections adapted for rubber work) are ground to the plate and articulated as for the ordinary rubber attachment. In the final arrangement or articulation of the teeth in the mouth, before finishing, they should be attached to the plate with a strong adhesive wax, or with gutta percha, to avoid displacement in the subsequent steps of the process. Remove the plate from the mouth, oil the outside of the teeth and edge of the plate, place the case on a piece of glass or paper, with the palatine surface of the plate upward. With equal parts plaster and white sand, take an impression of the outside of the teeth and edge of the plate, in two sections, meeting at the median line in front. When these impressions or moulds are sufficiently hard, they should be removed from the teeth and trimmed to about the one-half of an inch in thickness, so that the moisture can be easily driven off. As these moulds are friable when dry, it is well to place a strip or two of small

wire one inch and a half in length, in the body of the mould, before the material sets, to prevent their breaking. When the moulds are thoroughly dry, form a shallow cup around them with putty or sand for the reception of the metal and cast in the zinc; to form a die, get up the counter die with lead in the usual manner. In the dies thus prepared, strike up the rim for the outside edge. The gold used for this purpose should be fine, and not less than No. 30 Stebb's guage.

If there is to be no opportunity to test the accuracy of the articulation by trial in the mouth, before the work is completed, a small plaster articulator should be made before the teeth are disturbed, showing their exact position on the plate. Having secured this, remove the teeth from the plate by warming it slightly, and solder on the rim. This is best done by placing one section in position, retaining it there by means of small wire clasps, placing one at each end and one in the centre; commence soldering at the heel or back end; having secured this point, pass on to the centre and secure a point there, and finally at the front. Now place the teeth, which are still attached to the wax, in position, and see if they fit nicely down to the plate within the rim, if not, the position of the rim may be changed slightly to admit the teeth, and then the soldering completed; secure the opposite side in the same manner, uniting the ends in front. A very good means of securing a nice adaptation of the parts is obtained by placing the moulds in which the die for the rim is cast, in position on the plate, after removing the teeth and casting a little tinner's solder or even lead or tin, in the space formed by the gums of the teeth, thus forming a matrix which may be forced down inside the rim after the soldering is complete, bringing the rim out for the reception of the teeth. If this plan be adopted, one should be careful to cover the surface of the plate with carbon or some substance to prevent the metal adhering to it. Having completed the outside rim, place the teeth in position on the plate, and by means of the articulator or the patient's mouth, see that their position is correct. Secure them firmly to the plate with a stiff wax (composed of equal parts resin and beeswax); with a wax knife, trim out the wax

to the lingual border of the teeth, leaving only enough to cover the heads of the pins, scarcely that; trim as near to a perpendicular with the surface of the plate as convenient, flowing the surface on evenly; oil and take a plaster impression of the lingual surface of the plate and teeth, or the wax inside the teeth; from the plaster model thus formed, get up a set of dies and strike up the rim for the inside. This rim should also be of fine gold, and may be in two sections or a single piece; in thickness, about No. 26 or 28, dependent upon the case. The posterior ends of the outer and inner rims should be so formed as to be united around the end of the posterior block. When this inside rim is fitted nicely, one edge or border should fit the surface of the plate nicely all along the border of the wax, while the other border fits up nicely against the lingual surface or margin of the teeth. When the rim is thus fitted, place it in position and mark the position of the rivets, in the blocks, on the rim; remove the rim, and between the points indicated for the rivets, punch two holes with a plate punch, one above the other; prepare some small staples of gold wire; pass the ends through the holes, leaving the loops to project about the length of the pins in the blocks; solder them in on the lingual surface, and dress off the ends. These loops form the means of attaching the rubber. Place the rim in position on the plate, and retain it there by melting some shellac around the edge; carefully remove the teeth; prepare several wire clamps, of such shape, that while the open end clasps tightly the free margin of the rim, the opposite end is brought up to a line with the edge of the plate. Having placed these clamps in position around the rim, prepare an investment of equal parts plaster and sand, and invest the palatine surface of the plate, embracing the closed ends of these clamps. When the investment is hard, the shellac may be removed from the lingual surface of the rim and plate, the clamps retaining the rim in contact with the plate. Care should be taken that no plaster reach the plate, or rim, where the soldering is to be done. Heat up evenly and flow the solder. The plates should be clean, and the borax put only where it is necessary to flow the solder. When the soldering is completed, pickle the

plate and place the teeth in position; and if the rim should not fit the teeth nicely, burnish it down against them at all points, leaving no space for the rubber to show itself; prepare some rubber in small strips; set the plate with the teeth on in the oven, or in some place where it will get quite hot; remove all the blocks; place a few strips of rubber underneath the posterior block, on one side; place the block in position, forcing the excess of rubber forward underneath the second block; place more rubber under this second block, and press it down in the same manner. Proceed in this way till all are in position; if any rubber shows on pressing the last block to its place, remove it (the block) and cut off the surplus rubber; when all are in position and no rubber in sight, imbed the case in plaster, in a vulcanizing flask, and vulcanize. Finish the same as any ordinary gold plate.

Another mode of accomplishing the same end has been adopted by Dr. Hewitt, of this city. After preparing the plate for the reception of the teeth in the manner above described, he drills four or five holes through the plate, about one-eighth of an inch in diameter, along the ridge underneath the base ot the teeth; to these holes he fits very accurately little plugs of gold of the same material as the plate; he then packs the rubber into these holes, forcing it into one till it appears at the next, and so on till the case is packed; he then drives these plugs into the holes in the plate; the rubber closing around them, and into the notches previously made in the plugs, holds them fast, after the case is vulcanized. In finishing the plate, the protruding ends of these plugs are dressed off, and if neatly done, they cannot be seen.

Another plan of which we have heard, is the same except that the rubber is packed through holes in the posterior end of the rim, and then these holes are closed in the same or a similar way to that of Dr. Hewitt's. By having the teeth carved to suit special cases, a beautiful artistic effect can be produced both in and out of the mouth by this style of work.

When ordinary rubber block teeth are used, it is liable to the objection often urged against rubber work; the case may have a

stiff, artificial look; the shape and arrangement of the teeth may not be all that could be desired; still, it is superior in many respects to any other style of gold work. E.

CLUBS OF ALL THE DENTAL JOURNALS.

By W. E. Driscoll—Bedford, Indiana.

There is doubtless a very large number of dentists who would gladly take and read all, or nearly all, the dental journals now published, did not the aggregate sum of subscription look a little too formidable when multiplied by a few years.

Yet, what a grand consummation for the profession such a diffusion of our current periodical literature would be. *E. g.*, call on a brother practitioner who eagerly watches the monthly effusions of our professional press. How delightfully the moments pass in his genial presence. How proud you now feel of your "noble" profession. Step across the way to the "shop" of the man that never sees any of these expositors of the grand strides of advancement that dentistry is constantly making. What can *he* say or do that can interest you? Where would be your professional pride or ambition were he a fair specimen of the profession? How deep your disgust, and humiliating your reflection, had you to think such men gave to the dental profession its character. And who will deny that to a great extent they do? If there is a remedy should we not hasten to apply it? And what would be better than this plan?

Let the publishers of each magazine make a club arrangement with all the rest, so that an individual sending for all the journals, or nearly all of them, at once, could have a liberal reduction on the aggregate price of subscription, enough to make the reduction some inducement to members to enlarge the list of their professional periodicals; and thus make a handsome return to the publishers above ordinary receipts.

They are offering premiums from time to time for clubs. I, and I know many others, would prefer an extra journal to most

of the premiums offered. Then, each one could send in his own club, but as now arranged, can seldom prevail upon others to join him. Publishers of literary magazines have adopted this plan; let us try it.

BOOK NOTICE.

Dr. Wm. P. Dickinson, of Dubuque, Iowa, has laid upon our table for the use of the Missouri Dental College, a copy of his *Dental Plate Register and Ledger*. The need of some form of record adapted especially for this Department, by which the contract made at the time of preparing the mouth can be readily recorded, showing the number of teeth extracted, the number to be inserted, amount paid at the time, kind of base both temporary and permanent, with price of each and time of payment, has long been recognized by those in our profession engaged in mechanical dentistry. This record is admirably arranged to fill this want. By making the proper entries under the appropriate headings at the time of extracting the teeth, and subsequently as the work is being completed, the operator has a complete record of the whole transaction, which can be seen at a glance. Patients, and even operators, sometimes forget at the time of final settlement some of the points in a contract made twelve or eighteen months previous, the result of which is unpleasant and ofttimes expensive, by a proper use of this record, all trouble from this source is avoided. The work is gotten up in good style, on fine paper, and we trust will meet with a ready sale. Price, $3.50. Published by Jno. D. Mets, Blank Book Manufacturer, Dubuque, Iowa.

SENSITIVE DENTINE.

S. E. Cheesman, of Allensville, Ky., writes us that acetate of lead placed in the cavity of carious teeth will cure sensitive dentine in from five to seven minutes.

Try it and report. J.

BROOKLYN DENTAL SOCIETY.

The third annual meeting of this Society was held on the evening of October 3, at the residence of Dr. O. E. Hill, 127 Pierrepont street.

The various reports of officers and committees showed that the progress of the Society during the past year has been highly satisfactory to its members.

The new board of officers for the ensuing year is as follows:

President, G. A. Mills; Vice President, A. H. Brockway; Treasurer, I. C. Monroe; Recording Secretary, E. L. Childs; Corresponding Secretary, C. A. Marvin.

The Brooklyn Dental Infirmary, managed by this Society, was reported in a flourishing condition. Aid from the city was authorized at the last session of the legislature, with which aid it is proposed to employ a house dentist who shall be in attendance at all times, thus adding greatly to the usefulness of the Institution.

At the close of the evening the company were handsomely entertained in his dining-room, by the retiring President, Dr. O. E. Hill, at which entertainment upwards of forty of the dentists of Brooklyn were present.

EDWIN L. CHILDS, *Rec. Sec'y.*

DENTISTRY IN NEW JERSEY.

The entire dental profession of the State of New Jersey, are hereby cordially invited to meet in mass convention, in the city of Trenton, on Tuesday and Wednesday, October 25th and 26th, to form a State Dental Society, and to devise and adopt such other measures as may be deemed essential to our mutual improvement and elevation.

Let no dentist who has the good of his profession at heart stay away.

Let us all be there and by our action in convention show our

sister States that New Jersey is in full harmony with them in any movement that shall tend to advance the profession of our choice.

Jacob Perkins, Beverly; Leo H. de Lange, Bordentown; A. W. Kingsley, Elizabeth; A. A. Pierce, Elizabeth; Clarence E. Tallman, Freehold; S. W. Dickerson, Hackettstown; J. R. Goble, Hoboken; C. McNaughton, Jersey City; J. Hayhurst, Lambertville; J. S. Simmerman, Millville; C. S. Stockton, Mt. Holly; J. P. Geran, Matawan; T. Naylor Bradfield, Newark; E. H. Bunting, Newark; A. G. P. Colburn, Newark; G. F. J. Colburn, Newark; A. W. B. Crane, Newark; J. R. Reed, Newark; G. B. Garrison, Newton; J. W. Pool, Newton; E. F Hanks, Rahway; Charles Deppolt, Jr., Trenton; L. E. Redding, Trenton; Thos. S. Stephens, Trenton; T. B. Thorn, Trenton; G. R. Chambers, Vineland; John L. Trowbridge, Washington.

The enterprise has thus far met with universal approval, and needs only the active persistent labors of all united to establish the organization upon an honorable and permanent footing.

SOUTH CAROLINA STATE DENTAL ASSOCIATION.

The regular semi-annual meeting of this Association will be held in Charleston, S. C., Tuesday, November 1, 1870.

Members in attendance will be passed over the different railroads, to and from the city, for one fare.

By order of the President.

THOMAS T. MOORE, Cor. Sec.

A dentist in this city (Philadelphia) has traced out the career of one thousand dentists, with this result: one hundred and sixty-three died before they had reached middle life; six hundred and forty-three attained fair success; fifty-seven made fortunes; twenty-seven died from intemperance and other vices; ninety-six failed entirely; and three committed suicide.—[Dental Office and Laboratory.

The Missouri Dental Journal.

A MONTHLY RECORD OF THE SCIENCE.

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(*From the Medical Gazette.*)

EXTRACTS FROM PROF. HUXLEY'S ADDRESS,

Before the British Association for the Advancement of Science.

[Professor Huxley, the President, delivered his address on Wednesday evening, October 14, at the Philharmonic Hall. This Hall is one of the largest and handsomest in the kingdom, and it was filled to suffocation. About half the audience were ladies. Professor Stokes, the Rajah of Killapore, Earl of Derby, Sir Roderick Murchison, Professor Williamson, and many other savants too numerous to mention were present. Professor Huxley was received with great applause. He commenced by saying he would not attempt to give a panoramic survey of the world of science, but would endeavor to put before his audience the history of the rise and progress of a single biological doctrine.]

THE ORIGIN OF LIFE.

The philosophers of antiquity, interrogated as to the cause of these phenomena, were provided with a ready and plausible answer. It did not enter their minds even to doubt that these low forms of life were generated in the matters in which they made their appearance. Lucretius, who had drunk deeper of the scientific spirit than any poet of ancient or modern times except Goethe, intends to speak as a philosopher, rather than as a poet, when he writes that "with good reason the earth has gotten the. name Mother, since all things are produced out of the earth And many living creatures, even now, spring out of the earth, taking form by the rains and heat of the sun." The axiom of ancient science, "that the corruption of one thing is the birth of another," had its popular embodiment in the notion that a seed

dies before the young plant springs from it; a belief so wide-spread and so fixed, that Saint Paul appeals to it in one of the most splendid outbursts of his fervid eloquence:

"Thou fool, that which thou sowest is not quickened, except it die."

The proposition that life may, and does, proceed from that which has no life, then, was held alike by the philosophers, the poets, and the people, of the most enlightened nations, eighteen hundred years ago; and it remained the accepted doctrine of learned and unlearned Europe through the middle ages down even to the seventeenth century.

It is commonly counted among the many merits of our great countryman, Harvey, that he was the first to declare the opposition of fact to venerate authority in this, as in other matters; but I can discover no justification for this wide-spread notion. After careful search through the "Exercitations de Generatione," the most that appears clear to me is, that Harvey believed all animals and plants to spring from what he terms a "*primordium vegetale*," a phrase which may now-a-days be rendered "a vegetative germ;" and this, he says, is "*oviforme*," or "egg-like;" not, he is careful to add, that it necessarily has the shape of an egg, but because it has the constitution and nature of one. That this "primordium oviforme" must needs, in all cases, proceed from a living parent, is nowhere expressly maintained by Harvey, though such an opinion may be thought to be implied in one or two passages; while, on the other hand, he does, more than once, use language which is consistent only with a full belief in spontaneous or equivocal generation. In fact, the main concern of Harvey's wonderful little treatise is not with generation, in the physiological sense, at all, but with development; and his great object is the establishment of the doctrine of epigenesis.

The first distinct enunciation of the hypothesis that all living matter has sprung from pre-existing living matter came from a contemporary, though a junior, of Harvey; a native of that country, fertile in men great in all departments of human activity,

which was to intellectual Europe, in the sixteenth and seventeenth centuries, what Germany is in the nineteenth. It was in Italy, and from Italian teachers, that Harvey received the most important part of his scientific education. And it was a student trained in the same schools, Francesco Redi—a man of the widest knowledge and most versatile abilities, distinguished alike as scholar, poet, physician, and naturalist—who, just two hundred and two years ago, published his "Esperienze intorno alla Generazione degl' Insetti," and gave to the world the idea, the growth of which it is my purpose to trace. Redi's book went through five editions in twenty years; and the extreme simplicity of his experiments, and the clearness of his arguments, gained for his views, and for their consequences, almost universal acceptance.

SPONTANEOUS GENERATION.

Redi did not trouble himself much with speculative considerations, but attacked particular cases of what was supposed to be "spontaneous generation" experimentally. Here are dead animals, or pieces of meat, says he; I expose them to the air in hot weather, and in a few days they swarm with maggots. You tell me that these are generated in the dead flesh; but if I put similar bodies, while quite fresh, into a jar, and tie some fine gauze over the top of the jar, not a maggot makes its appearance, while the dead substances, nevertheless, putrefy just in the same way as before. It is obvious, therefore, that the maggots are not generated by the corruption of the meat; and that the cause of their formation must be a something which is kept away by gauze. But gauze will not keep away aëriform bodies, or fluids. This something must, therefore, exist in the form of solid particles too big to get through the gauze. Nor is one long left in doubt what these solid particles are; for the blowflies, attracted by the odor of the meat, swarm round the vessel and, urged by a powerful, but, in this case, misleading instinct, lay eggs, out of which maggots are immediately hatched upon the gauze. The conclusion, therefore, is unavoidable: the maggots are not generated by the meat, but the eggs which give rise to them are brought through the air by flies.

These experiments seem almost childishly simple, and one wonders how it was that no one ever thought of them before. Simple as they are, however, they are worthy of the most careful study, for every piece of experimental work since done, in regard to this subject, has been shaped upon the model furnished by the Italian philosopher. As the results of his experiments were the same, however varied the nature of the materials he used, it is not wonderful that there arose in Redi's mind a presumption, that in all such cases of the seeming production of life from dead matter, the real explanation was the introduction of living germs from without into that dead matter. And thus the hypothesis that living matter always arises by the agency of pre-existing living matter, took definite shape; and had, henceforward, a right to be considered and a claim to be refuted, in each particular case, before the production of living matter in any other way could be admitted by careful reasoners. It will be necessary for me to refer to this hypothesis so frequently, that, to save circumlocution, I shall call it the hypothesis of *Biogenesis;* and I shall term the contrary doctrine—that living matter may be produced by not living matter—the hypothesis of *Abiogenesis.*

[Professor Huxley then refers to Biogenesis, Revelations of the Microscope, and proceeds to review the lessons of Modern Chemistry as follows:]

THE LESSONS OF MODERN CHEMISTRY.

Modern chemistry, the birth of the latter half of the eighteenth century, grew apace, and soon found herself face to face with the great problems which biology had vainly tried to attack without her help. The discovery of oxygen led to the laying of the foundations of a scientific theory of respiration, and to an examination of the marvelous interactions of the organic substances with oxygen. The presence of free oxygen appeared to be one of the conditions of the existence of life, and of those singular changes in organic matters which are known as fermentation and putrefaction. The question of the generation of the infusory animalcules thus passed into a new phase. For what

might not have happened to the organic matter of the infusions, or the oxygen of the air, in Spallanzani's experiments? What security was there that the development of life which ought to have taken place had not been checked or prevented by these changes?

The battle had to be fought again. It was needful to repeat the experiments under conditions which would make sure that neither the oxygen of the air, nor the composition of the organic matter, was altered, in such a manner as to interfere with the existence of life.

Schulze and Schwann took up the question from this point of view in 1836 and 1837. The passage of air through red-hot glass tubes, or through strong sulphuric acid, does not alter the proportion of its oxygen, while it must needs arrest, or destroy, any organic matter which may be contained in the air. These experimenters, therefore, contrived arrangements by which the only air which should come into contact with a boiled infusion should be such as had either passed through red-hot tubes, or through strong sulphuric acid. The result which they obtained was that an infusion so treated developed no living things, while if the same infusion was afterwards exposed to the air such things appeared rapidly and abundantly. The accuracy of these experiments has been alternately denied and affirmed. Suppose them to be accepted, however, all that they really proved was, that the treatment to which the air was subjected destroyed *something* that was essential to the development of life in the infusion. This "something" might be gaseous, fluid, or solid; that it consisted of germs remained only an hypothesis of greater or less probability.

[After touching upon the subject of fermentation and putrefaction, and life germs in the air, he epitomizes the arguments as follows:]

THE ARGUMENTS EPITOMIZED.

To sum up the effect of this long chain of evidence:

It is demonstrable that a fluid eminently fit for the development of the lowest forms of life, but which contains neither germs

nor any protein compound, gives rise to living things in great abundance, if it is exposed to ordinary air; while no such development takes place if the air with which it is in contact is mechanically freed from the solid particles which ordinarily float in it, and which may be made visible by appropriate means.

It is demonstrable, that the great majority of these particles are destructible by heat, and that some of them are germs, or living particles, capable of giving rise to the same forms of life as those which appear when the fluid is exposed to unpurified air.

It is demonstrable, that inoculation of the experimental fluid with a drop of liquid known to contain living particles gives rise to the same phenomena as exposure to unpurified air.

And it is further certain that these living particles are so minute that the assumption of their suspension in ordinary air presents not the slightest difficulty. On the contrary, considering their lightness, and the wide diffusion of the organisms which produce them, it is impossible to conceive that they should not be suspended in the atmosphere in myriads.

Thus, the evidence, direct and indirect, in favor of *Biogenesis* for all known forms of life must, I think, be admitted to be of great weight.

On the other side, the sole assertions worthy of attention are, that hermetically sealed fluids, which have been exposed to great and long-continued heat, have sometimes exhibited living forms of low organization when they have been opened.

The first reply that suggests itself is the probability that there must be some error about these experiments, because they are performed on an enormous scale every day with quite contrary results. Meat, fruit, vegetables, the very materials of the most fermentable and putrescible infusions are preserved to the extent, I suppose I may say, of thousands of tons every year, by a method which is a mere application of Spallanzani's experiment. The matters to be preserved are well boiled in a tin case provided with a small hole, and this hole is soldered up when all the air in the case has been replaced by steam. By this method they may be kept for years without putrefying, fermenting, or

getting moldy. Now this is not because oxygen is excluded, inasmuch as it is now proved that free oxygen is not necessary for either fermentation or putrefaction. It is not because the tins are exhausted of air, for Vibriones and Bacteria live, as Pasteur has shown, without air or free oxygen. It is not because the boiled meats or vegetables are not putrescible or fermentable, as those who have had the misfortune to be in a ship supplied with unskilfully-closed tins well know. What is it, therefore, but the exclusion of germs? I think that Abiogenists are bound to answer this question before they ask us to consider new experiments of precisely the same order.

And, in the next place, if the results of the experiments I refer to are really trustworthy, it by no means follows that Abiogenesis has taken place. The resistance of living matter to heat is known to vary within considerable limits, and to depend, to some extent, upon the chemical and physical qualities of the surrounding medium. But if, in the present state of science, the alternative is offered us: either germs can stand a greater heat than has been supposed—or the molecules of dead matter, for no valid or intelligible reason that is assigned, are able to rearrange themselves into living bodies, exactly such as can be demonstrated to be frequently produced in another way, I cannot understand how choice can be, even for a moment, doubtful.

THE ORIGIN OF LIFE.

But though I cannot express this conviction of mine too strongly, I must carefully guard myself against the supposition that I intend to suggest that no such thing as Abiogenesis ever has taken place in the past, or ever will take place in the future. With organic chemistry, molecular physics, and physiology yet in their infancy, and every day making prodigious strides, I think it would be the height of presumption for any man to say that the conditions under which matter assumes the properties we call "vital" may not, some day, be artificially brought together. All I feel justified in affirming is, that I see no reason for believing that the feat has been performed yet.

And, looking back through the prodigious vista of the past, I find no record of the commencement of life, and therefore I am devoid of any means of forming a definite conclusion as to the conditions of its appearance. Belief, in the scientific sense of the word, is a serious matter, and needs strong foundations. To say, therefore, in the admitted absence of evidence, that I have any belief as to the mode in which the existing forms of life have originated, would be using words in a wrong sense. But expectation is permissible where belief is not; and if it were given me to look beyond the abyss of geologically recorded time, to the still more remote period when the earth was passing through physical and chemical conditions, which it can no more see again than a man can recall his infancy, I should expect to be a witness of the evolution of living protoplasm from not living matter. I should expect to see it appear under forms of great simplicity, endowed, like existing Fungi, with the power of determining the formation of new protoplasm from such matters as ammonium carbonates, oxalates, and tartrates, alkaline and earthy phosphates, and water, without the aid of light. That is the expectation to which analogical reasoning leads me; but I beg you once more to recollect that I have no right to call my opinion anything but an act of philosophical faith.

So much for the history of the progress of Redi's great doctrine of Biogenesis, which appears to me, with the limitations I have expressed, to be victorious along the whole line at the present day.

DEVELOPMENT OF SPECIES.

As regards the second problem offered to us by Redi, whether Xenogenesis obtains side by side with Homogenesis, whether, that is, there exist not only the ordinary living things, giving rise to offspring which run through the same cycle as themselves, but also others, producing offspring which are of a totally different character from themselves,—the researches of two centuries have led to a different result. That the grubs found in galls are no product of the plants on which the galls grow, but are the

result of the introduction of the eggs of insects into the substance of these plants, was made out by Vallisnieri, Reaumur, and others, before the end of the first half of the eighteenth century. The tapeworms, bladderworms, and flukes continued to be a stronghold of the advocates of Xenogenesis for a much longer period. Indeed, it is only within the last thirty years, that the splendid patience of von Siebold, Van Beneden, Leuckart, Kuchenmeister, and other helminthologists, has succeeded in tracing every such parasite, often through the strangest wanderings and metamorphoses, to an egg derived from a parent, actually or potentially like itself; and the tendency of inquiries elsewhere has all been in the same direction. A plant may throw off bulbs, but these, sooner or later, give rise to seeds or spores, which develop into the original form. A polype may give rise to medusæ, or a pluteus to an echinoderm; but the medusæ and the echinoderm give rise to eggs which produce polypes or plutei, and they are therefore only stages in the cycle of life of the species.

But if we turn to pathology it offers us some remarkable approximations to true Xenogenesis.

As I have already mentioned, it has been known since the time of Vallisnieri and of Reaumur, that galls in plants and tumors in cattle are caused by insects, which lay their eggs in those parts of the animal or vegetable frame of which these morbid structures are outgrowths. Again, it is a matter of familiar experience to everybody that mere pressure on the skin will give rise to a corn. Now, the gall, the tumor, and the corn, are parts of the living body, which have become, to a certain degree, independent and distinct organisms. Under the influence of certain external conditions, elements of the body, which should have developed in due subordination to its general plan, set up for themselves, and apply the nourishment which they receive to their own purposes.

From such innocent productions as corns and warts there are all gradations, to the serious tumors which, by their mere size and the mechanical obstruction they cause, destroy the organism out of which they are developed; while, finally, in those terrible

structures known as cancers, the abnormal growth has acquired powers of reproduction and multiplication, and is only morphologically distinguishable from the parasitic worm, the life of which is neither more nor less, closely bound up with that of the infested organism.

If there were a kind of diseased structure, the histological elements of which were capable of maintaining a separate and independent existence out of the body, it seems to me that the shadowy boundary between morbid growth and Xenogenesis would be effaced. And I am inclined to think that the progress of discovery has almost brought us to this point already. I have been favored by Mr. Simon with an early copy of the last published of the valuable "Reports on the Public Health," which in his capacity of their medical officer, he annually presents to the Lords of the Privy Council. The appendix to this report contains an introductory essay "On the Intimate Pathology of Contagion," by Dr. Burdon Sanderson, which is one of the clearest, most comprehensive, and well-reasoned discussions of a great question which has come under my notice for a long time. I refer you to it for details, and for the authorities for the statements I am about to make.

VACCINATION.

You are familiar with what happens in vaccination. A minute cut is made in the skin, and an infinitesimal quantity of vaccine matter is inserted into the wound. Within a certain time a vesicle appears in the place of the wound, and the fluid which distends this vesicle is vaccine matter, in quantity a hundred or a thousandfold that which was originally inserted. Now what has taken place in the course of this operation? Has the vaccine matter by its irritative property produced a mere blister, the fluid of which has the same irritative property? Or does the vaccine matter contain living particles, which have grown and multiplied where they have been planted? The observations of M. Chauveau, extended and confirmed by Dr. Sanderson himself, appear to leave no doubt upon this head. Experiments

similar in principle to those of Helmholtz on fermentation and putrefaction, have proved that the active element in the vaccine lymph is non-diffusible, and consists of minute particles not exceeding 1-20,000th of an inch in diameter, which are made visible in the lymph by the microscope. Similar experiments have rov ed that two of the most destructive of epizootic diseases, sheep-pox and glanders, are also dependent for their existence and their propagation upon extremely small living solid particles, to which the title of *microzymes* is applied. An animal suffering under either of these terrible diseases is a source of infection and contagion to others, for precisely the same reason as a tub of fermenting beer is capable of propagating its fermentation by "infection" or "contagion," to fresh wort. In both cases it is the solid living particles which are efficient; the liquid in which they float, and at the expense of which they live, being altogether passive.

Now arises the question, are those microzymes the results of *Homogenesis* or of *Xenogenesis;* are they capable, like the Torulæ of yeast, of arising only by the development of pre-existing germs; or may they be, like the constituents of a nut-gall, the results of a modification and individualization of the tissues of the body in which they are found, resulting from the operation of certain conditions? Are they parasites in the zoological sense, or are they merely what Virchow has called "heterologous growths?" It is obvious that this question has the most profound importance, whether we look at it from a practical or from a theoretical point of view. A parasite may be stamped out by destroying its germs, but a pathological product can only be annihilated by removing the conditions which give rise to it.

It appears to me that this great problem will have to be solved for each zymotic disease separately, for analogy cuts two ways. I have dwelt upon the analogy of pathological modification, which is in favor of the xenogenetic origin of microzymes; but I must now speak of the equally strong analogies in favor of the origin of such pestiferous particles by the ordinary process of the generation of like from like.

It is, at present, a well-established fact that certain diseases,

both of plants and of animals, which have all the characters of contagious and infectious epidemics, are caused by minute organisms. The smut of wheat is a well-known instance of such a disease, and it cannot be doubted that the grape disease and the potato disease fall under the same category. Among animals, insects are wonderfully liable to the ravages of contagious and infectious diseases caused by microscopic *Fungi.*

FLY PLAGUES.

In autumn it is not uncommon to see flies motionless upon a window-pane, with a sort of magic circle in white drawn around them. On microscopic examination, the magic circle is found to consist of innumerable spores, which have been thrown off in all directions by a minute fungus called *empusa muscæ*, the spore-forming filaments of which stand out like a pile of velvet from the body of the fly. These spore-forming filaments are connected with others, which fill the interior of the fly's body like so much fine wool, having eaten away and destroyed the creature's viscera. This is the full-grown condition of the empusa. If traced back to its earlier stages, in flies which are still active, and to all appearances healthy, it is found to exist in the form of minute corpuscles which float in the blood of the fly. These multiply and lengthen into filaments at the expense of the fly's substance; and when they have at last killed the patient, they grow out of its body and give off spores. Healthy flies shut up with diseased ones catch this mortal disease and perish like the others. A most competent observer, M. Cohn, who studied the development of the empusa in the fly very carefully, was utterly unable to discover in what manner the smallest germs of the empusa got into the fly. The spores could not be made to give rise to such germs by cultivation, nor were such germs discoverable in the air, or in the food of the fly. It looks exceedingly like a case of abiogenesis, or, at any rate, of xenogenesis, and it is only quite recently that the real course of events has been made out. It has been ascertained that when one of the spores falls upon the body of a fly it begins to germinate and sends out a process which bores its way through the

fly's skin; this having reached the interior cavities of its body, gives off the minute floating corpuscles, which are the earliest stage of the empusa. The disease is "contagious," because a healthy fly coming in contact with a diseased one, from which the spore-bearing filaments protrude, is pretty sure to carry off a spore or two. It is "infectious," because the spores become scattered about all sorts of matter in the neighborhood of the slain flies.

DISEASE OF THE SILKWORM.

The silkworm has long been known to be subject to a very fatal, contagious, and infectious disease, called the muscardine. Audouin transmitted it by inoculation. The disease is entirely due to the development of a fungus, Botrytis Bassiana, in the body of the caterpillar, and its contagiousness and infectiousness are accounted for in the same way as those of the fly-disease. But of late years a still more serious epizootic has appeared among the silkworms, and I may mention a few facts which will give you some conception of the gravity of the injury which it has inflicted on France alone.

The production of silk has been, for centuries, an important branch of industry in Southern France, and in the year 1853, it had attained such a magnitude that the annual produce of the French sericulture was estimated to amount to a tenth of that of the whole world, and represented a money value of one hundred and seventeen millions of francs, or nearly five millions sterling. What may be the sum which would represent the money value of all the industries connected with the working up of the raw silk thus produced, is more than I can pretend to estimate. Suffice it to say, that the city of Lyons is built upon French silk, as much as Manchester was upon American cotton before the civil war.

Silkworms are liable to many diseases, and even before 1853 a peculiar epizootic, frequently accompanied by the appearance of dark spots upon the skin (whence the name of "Pebrine," which it has received,) had been noted for its mortality. But in the years following 1853 the malady broke out with such extreme violence, that in 1856 the silk crop was reduced to a third

of the amount which it had reached in 1853; and up till within the last year or two, it has never attained half the yield of 1853. This means not only that the great number of people engaged in silk-growing are some thirty millions sterling poorer than they might have been; it means not only that high prices have had to be paid for imported silkworm eggs, and that after investing his money in them, in paying for mulberry leaves and for attendance, the cultivator has constantly seen his silkworms perish and himself plunged into ruin, but it means that the looms of Lyons have lacked employment, and that, for years, enforced idleness and misery have been the portion of a vast population which, in former days, was industrious and well to do.

In 1858 the gravity of the situation caused the French Academy of Science to appoint commissioners, of whom a distinguished naturalist, M. de Quatrefages, was one, to inquire into the nature of this disease, and if possible, to devise some means of staying the plague. In reading the report made by M. de Quatrefages, in 1859, it is exceedingly interesting to observe that his elaborate study of the Pebrine forced the conviction upon his mind that, in its mode of occurrence and propagation, the disease of the silkworm is in every respect comparable to the cholera among mankind. But it differs from the cholera, and so far, is a more formidable disease, in being under some circumstances contagious as well as infectious.

The Italian naturalist, Filippi, discovered in the blood of the silkworms affected by this disease, a multitude of cylindrical corpuscles, each about 1-6000 of an inch long. These have been carefully studied by Lebert, and named by him Panhistophyton, for the reason that in subjects in which the disease is strongly developed, the corpuscles swarm in every tissue and organ of the body, and even pass into the undeveloped eggs of the female moth. But are these corpuscles causes or mere concomitants of the disease? Some naturalists took one view and some another; and it was not until the French Government, alarmed by the continued ravages of the malady, and the inefficiency of the remedies which had been suggested, despatched M. Pasteur to study it, that the question received its final settle-

ment, at a great sacrifice, not only of time and peace of mind of that eminent philosopher, but, I regret to have to add, of his health.

But the sacrifice has not been in vain. It is now certain that the devastating, cholera-like Pebrine is the effect of the growth and multiplication of the Panhistophyton in the silkworm. It is contagious and infectious, because the corpuscles of the Panhistophyton pass away from the bodies of the diseased caterpillars, directly or indirectly, to the alimentary canal of healthy silkworms in their neighborhood; it is hereditary because the corpuscles enter into the eggs while they are being formed, and consequently are carried within them when they are laid; and for this reason also, it presents the very singular peculiarity of being inherited only on the mother's side. There is not a single one of all the apparently capricious and unaccountable phenomena presented by the Pebrine, but has received its explanation from the fact that the disease is the result of the presence of a microscopic organism, Panhistophyton.

Such being the facts with respect to the Pebrine, what are the indications as to the method of preventing it? It is obvious that this depends upon the way in which the Panhistophyton is generated. If it may be generated by Abiogenesis, or by Xenogenesis, within the silkworm or its moth, the extirpation of the disease must depend upon the prevention of the occurrence of the conditions under which this generation takes place. But if, on the other hand, the Panhistophyton is an independent organism, which is no more generated by the silkworm than the mistletoe is generated by the oak, or the apple tree, on which it grows, though it may need the silkworm for its development in the same way as the mistletoe needs the tree, then the indications are totally different. The sole thing to be done is to get rid of and keep away the germs of the Panhistophyton. As might be imagined, from the course of his previous investigations, M. Pasteur was led to believe that the latter was the right theory; and guided by that theory, he has devised a method of extirpating the disease, which has proved to be completely successful wherever it has been properly carried out.

There can be no reason then for doubting that among insects, contagious and infectious diseases of great malignity are caused by minute organisms, which are produced from pre-existing germs, or by Homogenesis; and there is no reason, that I know of, for believing that what happens in insects may not take place in the highest animals. Indeed there is already strong evidence that some diseases of an extremely malignant and fatal character to which man is subject, are as much the work of minute organisms as the Pebrine. I refer for this evidence to the very striking facts adduced by Professor Lister, in his various well-known publications on the antiseptic method of treatment. It seems to me impossible to rise from the perusal of those publications without a strong conviction that the lamentable mortality which so frequently dogs the footsteps of the most skillful operator, and those deadly consequences of wounds and injuries which seem to haunt the very walls of great hospitals, and are, even now, destroying more men than die of bullet or bayonet, are due to the importation of minute organisms into wounds, and their increase and multiplication; and that the surgeon who saves most lives will be he who works out the practical consequences of the hypothesis of Redi.

CONCLUSIONS.

I commenced this address by asking you to follow me in an attempt to trace the path which has been followed by a scientific idea, in its long and slow progress from the position of a probable hypothesis to that of an established law of nature. Our survey has not taken us into very attractive regions; it has lain chiefly in a land flowing with the abominable, and peopled with mere grubs and moldiness. And it may be imagined with what smiles and shrugs practical and serious cotemporaries of Redi and of Spallanzani may have commented on the waste of their high abilities in toiling at the solution of problems which, though curious enough in themselves, could be of no conceivable utility to mankind.

Nevertheless, you will have observed that before we had traveled very far upon our road, there appeared on the right hand and on the left, fields laden with a harvest of golden

grain, immediately convertible into those things which the most sordidly practical of men will admit to have value—namely, money and life.

The direct loss to France caused by the Pebrine in seventeen years, cannot be estimated at less than fifty million sterling; and if we add to this what Redi's idea, in Pasteur's hands, has done for the wine-grower and for the vinegar-maker, and try to capitalize its value, we shall find that it will go a long way towards repairing the money losses caused by the frightful and calamitous war of this autumn.

And as to the equivalent of Redi's thought in life, how can we over-estimate the value of the knowledge of the nature of epidemic and epizootic diseases, and consequently of the means of checking or eradicating them, the dawn of which has assuredly commenced.

Looking back no further than ten years, it is possible to select three (1863, 1864, and 1869) in which the total number of deaths from scarlet fever alone amounted to ninety thousand. That is the return of killed, the maimed and disabled being left out of sight. Why, it is to be hoped that the list of killed in the present bloodiest of all wars will not amount to more than this! But the facts which I have placed before you must leave the least sanguine without a doubt that the nature and causes of the scourge will, one day, be as well understood as those of the Pebrine are now, and that the long-suffered massacre of our innocents will come to an end.

And thus mankind will have one more admonition that "the people perish for lack of knowledge;" and that the alleviation of the miseries and the promotion of the welfare of men must be sought by those who will not lose their pains in that diligent, patient, loving study of all the multitudinous aspects of nature, the results of which constitute exact knowledge or science.

It is the justification and the glory of this great meeting that it is gathered together for no other object than the advancement of the moiety of science which deals with those phenomena of nature which we call physical. May its endeavors be crowned with a full measure of success!—[Medical Press and Circular.

Operative and Surgical Dentistry.

PLUGGING TEETH.

TO STUDENTS.

CASE.—The lower first molar on the right side has a crown cavity embracing nearly the whole of the dentine down to very near the pulp. Excavation for decay results in piercing the posterior approximal wall, which is weakened by necrosis of the enamel. I cut this wall away from the grinding edge to the gum where the dentos is sound, still leaving a curbing at this point of sufficient height to assist in retaining a plug. The anterior approximal wall is destroyed by decay from the approximal surface, and this cavity has been sometime plugged, but the decay had extended under the plug at its cervical margin, and the consequence is that the cavity extends now far below the margin of the gum. After preparing the tooth for plugging, I find it in this condition, viz: The buccal and lingual walls standing alone; an open road through from the approximal surface of the second bicuspid to the approximal surface of the second molar; the buccal wall lined with dentine and pretty strong; the lingual wall composed only of enamel and consequently weak. The pulp cavity nowhere really exposed, but nearly so, especially over the anterior root. The depression in the centre of the grinding border of the enamel is slightly cut into for the purpose of receiving gold to act as a binder when the plug is finished.

I find that the rubber dam cannot be applied to this tooth in this condition, for it cannot be gotten below the cavity on the anterior approximal side by any possibility. The operation will require much time, and I had rather not depend on the tongue holder and spunk for so wearisome a sitting.

Well, what shall I do? I will use the duct compressors for

a short time, long enough to fill the whole cavity with ox. chlo. zinc, and keep the same dry fifteen minutes.

While this is hardening I will prepare some gold for plugging the same cavity. Here, now, are four large cylinders of Abbey's No. 4 soft foil. Each one is one-fourth larger than the depth of the cavity, and of a diameter equal to half that of the bucco-lingual diameter of the tooth.

Here, in this compartment, are eight leaves of "Ney's" No. 4 adhesive foil, cut into pellets made from ropes of half sheets.

I will now cut up a sheet of Johnston's No. 30 into strips half an inch long and an eighth of an inch wide. We shall want a dozen or two squares of No. 60 adhesive foil, also.

The osteoplastic is hard enough now, and we will commence our operations on the tooth again. We will put on the rubber dam first, you will soon see what for.

I shall remove all this "osteo" except the anterior lower half of the plug, viz: that portion which is below the gum and as much more above the gum, which if removed would make a medium sized cavity. Besides this I will strengthen the buccal wall of enamel, which we found weak, by leaving a lining of "osteo" in contact with it, continuing up to the grinding surface, less the sixteenth of an inch.

Having on the rubber dam keeps the osteo, lining the weak enamel wall, dry. The débris of the osteo plug is not quite as easily removed from the teeth as without the dam, still there is no particular difficulty, and the lingual wall will be stronger for it.

The tooth is now ready to plug with gold; but remember we will do so with the "osteo," occupying a considerable portion of the anterior part of the tooth. You see that the ox. chlo. zinc is left in the lower third of the anterior approximal surface.

First let us fill all that portion of the tooth not occupied by the osteo, and then remove the latter, together with the rubber dam, and plug the rest of the cavity.

Those soft cylinders, that I made, we will now use. Place one in the cavity, laying it down so that one end will reach across the space between this tooth and the second molar; with a flat in-

strument press the gold against the lingual wall; place another and another until the space between the buccal and lingual walls is occupied by gold; now condense this soft unadhesive gold with a heavy mallet, and a serrated foot instrument, being careful as we carry the foot down by the edges of the walls, not to fracture them, but be sure at the same time to make a perfect joint; condense the gold between the teeth, as well as that within the cavity, so that we may have a good face to the plug when it is finished.

Now we will commence the use of our pellets of No. 4 adhesive gold. Anneal one over the flame and mallet it into the soft cylinders; it will stay there, and we will go all over the surface of these cylinders in this way. Fill all the space with these pellets up to within a sixteenth of an inch of the grinding margin, interweaving more or less of the strips of No. 30, laying them down at length. Keep the plug about level all the time. Fill up with No. 30 strips, and finish with squares of No. 60. The surface of this plug will bear considerable burring down. On the top you see it extending from the second bicuspid tooth to the second molar. You see also that we have carried the gold over the buccal and lingual walls in the middle and filled the slots that I cut there; so that these walls are firmly bound together on the top. In filling these slots I was very careful not to crack these frail walls by heavy blows, in consolidating the gold.

I have used a small foot instrument nearly all the time in packing the plug. We will now take a small pointed plugger, nearly smooth, and go over the whole surface of it. The revolving burr will now bring the surface down to the desired level handsomely. As I get nearly through with the burr I examine with the magnifyer the surface, and find that some would be improved by re-malleting.

So we will stop and take up the small pointed plugger again, and go over the whole surface of the plug again and mallet it "to death." The burr again. Here is a plug that will finish up beautifully with pumice, diamond dust and chalk. The gold

between the approximal surfaces is filed out and these faces polished also.

The gold work looks well, but that "osteo" plug on the anterior surface diving down under the gum must come out now, and gold take its place.

We can have the advantage of the rubber dam no longer. It has served us well for two hours. It comes off.

I remove the "osteo," being careful not to wound the gum. The cavity is syringed out, and a good shaped one it is found to be, with solid gold walls, mostly.

Apply the parotid duct compressor to the left cheek, and the tongue holder. Each of these presses a thick piece of spunk against the mouth of the ducts and effectually closes them. A piece of the same substance is conveniently held against the right cheek and excludes the saliva from the duct of Steno. I shall now take several cylinders of Abbey's No. 4 soft foil, and fill all that portion of the cavity beneath the gum, and the buccal half of the cavity which is above the gum. The ends of the cylinders project beyond the margin of the cavity and compress the gum so that no moisture comes from it. The remainder of the cavity is filled with adhesive gold. There has been no trouble from saliva or moisture.

This last plug has not taken over half an hour to make, and as it is filed and polished it presents as good a surface as the previous plug, from which it cannot be distinguished. Care is taken to condense the ends of the cylinders under the gum with a long and thin foot instrument, and the surplus is removed with thin chisels, thin files, &c., and polished. The powders are effectually removed with the syringe and tepid water. No débris should be allowed to remain here as it would be likely to cause inflammation. Neither should a plug be suffered to project beyond the dentos at this point, as such a source of irritation to the sensative gum is likely to produce decay in the dentos about it. It should be remembered that an irritated gum will always produce an acidulous fluid which will surely decalcify the dentine.

CHASE.

REMOVAL OF SALIVARY CALCULUS.

(TO STUDENTS.)

Be sure that you are *ready* to perform this operation before you commence. Of course one ought to be ready before commencing any operation, but I speak in this way of this particular operation, because it is apt to be underrated not only by students, but by older practitioners.

First, then, seat your patient properly; if the under teeth are to be cleansed first, let the seat be low; you will need to stand above, and partly behind the chair on the right side, much of the time.

A clean napkin, three-fourths of a yard square, is to be pinned around her neck, to protect the dress from blood, water, etc. Another napkin to be pinned on the back of the chair for your own hands. Some small mouth napkins, two by eight inches, to use about the lips, to wipe your instruments on, etc. A *colored* tumbler, in which constantly to rinse off the tartar and blood from the scalers used. A colored tumbler is important for the purpose of concealing the contents, which are often disgusting to the patient. A *lady* cares much for appearances. She generally considers this a disgusting operation, and will appreciate any efforts you may make to render it less so to her. You need pulverized pumice stone, and chalk, for polishing powders; a porte polisher, and a smooth elm or bass wood stick eight inches long.

A syringe will be necessary also, to be used with a tumbler of clean warm water.

The instruments for the removal of tartar should be small, thin edged, and sharp. Nearly all the scalers found in shops, are twice too large, and clumsy. Besides the curved pointed, and curved square edged instruments, you will find exceedingly delicate chisels and hatchet excavators, useful.

I would commence on a posterior molar of one side of the mouth, on the lingual surface, and continue around to the corresponding molar of the other side. Before polishing this lin-

gual surface, proceed in the same way with the buccal surfaces of these teeth. Now with the chisels and excavators, remove everything on the approximal surfaces.

The scales of tartar are easier loosened by inserting the instrument under their lower border. After cleaning all portions of the teeth *above* the gums, the necks, which are under the gums, should secure especial attention. Here, in fact, is the most important work to do; not a granule of this irritating lime deposit should be left in this location, for the smallest one will afford a point of support for a new deposit, and the operation must then be repeated in a few months. Here we find hatchet excavators useful, scraping upwards with the *long* side of the blade.

The syringe should often be used to force away the debris left under the gums and between the teeth. The instruments should be wiped on the small napkin after each rinsing in the colored tumbler. The water in the latter should be tepid, and occasionally changed for clean water.

After scaling is finished, the polishing powder must be patiently used; pumice, then chalk.

If the operation has been prolonged, and especially if it has been bloody, another appointment should be made for the following day, to see that nothing has been left undone that ought to be done.

Some teeth appear to be perfectly free from tartar to the unprofessional. But observe that little *rose* spot on the gum, just at its edge, or below its margin. There is a granule of tartar there, and its rough surface has caused the spark of inflammation which you see in the gum. Remove it.

The under front teeth are often very loose from the absorption of alveoli, caused by present tartar. There is sometimes *danger* in removing the calculus, unless the teeth are *fixed*. Well, then, give them support by softening gutta percha in hot water, and pressing it over the buccal surfaces of half a dozen teeth to be operated upon. After the deposit on the lingual side has been thoroughly removed, we can change the gutta percha to that side of the teeth, and cleanse the buccal surfaces.

The patient may be benefited by using an astringent wash for a few days, in order to hasten the closure of the gums around the necks of the teeth as soon as possible. The sooner and more effectually this is done, the less likely is the tartar to commence its deposit again, soon. If the gums are spongy, it will be of service to slit up every festoon with a *sharp* lancet or knife; the bleeding will be useful, and the cicatrix will assist in causing a shrinking of the part between the teeth.

CHASE.

INFLAMMATION OF THE GUMS AND LIPS.

(TO STUDENTS.)

One of the most common causes of the above, is the dentist himself, in his operations on the mouth. The careless way creosote, iodine, and similar escharotics are used, is to be heartily condemned.

I have seen extensive excavations of the buccal cavity produced by thoughtless manipulations of good operators.

A very thin sheet of rubber should be used to cover the lips, instead of a napkin, in using escharotics.

Wipe the lips with glycerine, if you have no rubber, before you apply a napkin. Glycerine or sweet oil will prevent ill effects from creosote. In using carbolic acid, chloride of zinc, or indeed any irritating fluid about the teeth, the adjacent soft parts should be protected by pieces of spunk laid close up to the tooth operated upon, so that it (the spunk) will be sure to absorb all surplus material. Besides this, the soft parts may be pencilled over with sweet oil or glycerine.

When the lips of a patient are cracked and look irritable, for whom you are plugging teeth, do not lay a *dry* napkin on them or even your own fingers, but rather use a wet napkin or a thin sheet of rubber, first painting them with glycerine.

CHASE.

ALVEOLAR ABSCESS.

[*Continued from Page* 367.]

When the pus escapes along the side of the fang, and the abscess continues for any considerable length of time, the periosteal structures are apt to be destroyed in that location, and the chances of success are much less than when this complication does not exist. A question naturally arises in relation to the possibility or probability of a reproduction of the periosteum or peridenteum, and a re-establishment of the connection, through these media, between the fang and alveolar walls. When bone is denuded of its periosteal covering, there is apt to be an exfoliation of its external layers; but after the exfoliation has taken place, a new covering is organized, and the normal status is again attained. Moreover, exfoliation does not always take place, but under favorable circumstances a reproduction takes place without exfoliation.

Now, the most favorable conditions for reproduction would doubtless be furnished by a location which should be completely shielded from atmospheric influences, and it is therefore probable that such reproduction may take place in the sockets of the tush.

In these cases, after the formation of pus has been completely arrested, the parts should be stimulated to increased action by tinct. of iodine, or a solution of nitrate of silver, and although sometimes slow in assuming a healthy aspect, there may be a reasonable expectation of final success.

The philosophy of the common treatment of alveolar abscess is perhaps as well understood as our imperfect knowledge of pathology and physiology will permit, so that we must learn more of the laws of life, and more in relation to those disturbances of vital actions which we call pathological, before we can hope to construct a system of cure that will in all respects accord with known scientific principles.

In case of abscess, we have a production of pus which it is

necessary to arrest. There is loss of tissue, which is to be restored; and inflammatory action, which must be subdued.

But we might state the case more simply, by stating that we have inflammatory action, with consequent production or formation of pus and loss of tissue, that must be reproduced.

One thing seems to be pretty well established, and that is that tinct. of iodine or creasote, applied to the suppurating parts, arrests the suppuration; and as this is consequent upon the inflammation, it would be equally true to state that it arrests, or diminishes, the inflammatory action. But the question is, how is this accomplished? We know that stimulants cause the small vessels of the part to contract, and expel the blood which they contain, and the congestion, which seems to be nearly always present in parts where suppuration is going on. is removed.

If we would utilize the results obtained by investigation lately made upon the structure of the minute blood vessels, we should very surely come to the conclusion that the removal of the congestions which occur in inflammations, would have a very decided influence upon the production of pus.

It has been pretty well established by Cohnheim, that the pus corpuscles or leucocytes escape from the blood, and the observations of Dr. Ernst Oedmonson, of Stockholm, have also demonstrated that the capillary walls are formed of cells; that the cellular elements which form these walls, are placed together much like the cells in a pavement epithelium, and that there are minute stomata or openings between the cells. These stomata in the normal condition are too small to admit of the passage of white corpuscles, but when the capillaries are distended with blood, the openings are so much enlarged that the white cells do escape, and the process of suppuration is established. But if we are to rely upon the statements of Klien, we must at once admit that this stimulation is not all that is necessary to accomplish a cure. He states that he has observed pus cells multiplying outside of the vessels by division, and the enormous quantity of pus produced in case of large abscesses and suppurating wounds, is in this way accounted for.

So we must suppose that these stimulants not only relieve the

congestion, and thereby change the conditions of the vessels, so that the production of pus from white corpuscles, which were escaping through the walls of the vessels, is arrested; but they also reach the pus cells, and render them incapable of further reproduction.

But before coming to definite conclusions upon these points, we must take another view of this subject.

We must remember that all white blood corpuscles which escape from the blood vessels, do not become pus cells; but under favorable conditions these elements are organized into connective tissue, and thus form the very foundation or basis of tissues that are reproduced when a loss of structure has taken place.

What conditions determine the fate of the leucocytes in these different developments, is as yet not certainly known, though it has been surmised that it depends mainly upon the degree of the inflammatory action. It is undoubtedly true that a high degree of the inflammation is incompatible with the reparatory process, and it is likewise pretty well determined that some inflammation, if not an absolute necessity, is at least an adjuvant in the reproduction of tissue; but whether there are other modifying conditions which are important in the determination of this question, is not definitely known. With these facts before us, we can easily understand why it is advisable that a stimulating fluid should be brought in contact with every part of the pyogenic sac and the simiosities of the fistulous opening, in order that the pus cells may be rendered incapable of farther multiplication or increase.

We are well aware that this sketch upon Alveolar Abscess and the philosophy of its treatment, is far from being complete, for the whole study of inflammation is yet in its infancy so far as material progress is concerned, offering, as it still does, a boundless field for investigation and research; but to those who desire to study and practice Dentistry as a science, and who are not satisfied with empiricism but seek rather to understand the relations of things, we trust it may not be altogether void of interest. J.

From the Dental Cosmos.

EPULIS.

Clinic of Dr. J. E. Garretson, University of Pennsylvania; Reported by De Forest Willard, M. D.

I exhibit to the class this young man, who has, as I want all distinctly to see, a fleshy growth springing from the gum between two of his teeth; this growth falling into and filling a very large cavity in the side of one of them, — the first molar. I want you to look at this little tumor closely, because, insignificant as it is, it can furnish us with a text, the study of which may, on future occasions, prove of very great service to all here assembled.

Let me strengthen the force of the text by saying that, for the cure of just such a tumor as the one before us, I have seen a patient maimed in appearance and comfort for life, through a resection of the jaw performed for its cure; while I will show you that this one, the analogue, will be cured without being even touched, except as such touching may concern the extracting of a tooth.

The study, not of epulis but of the epulides, is one which I much desire to be able to make very plain to you, for, if you fail to comprehend the subject clinically, I am pretty certain you will not get a sufficiently clear comprehension of it from the books — at least for practical purposes.

Let us begin at the beginning. What is an epulis? There is no special disease which can be so called with a distinctive meaning. The derivation of this word "epulis" is from επι, upon, and *οὐλον*, the gum, and thus signifies a something or anything upon the gum. What would the class think, should I show you a mass of tartar encircling a tooth and resting upon the gum, and call this mass an epulis? Yet, for all, it would be epulic, and I would have the same right to call it epulis as has the most learned writer who gives this name to any other condition of the gums. The term is at fault — it is inadequate in expression used

as a noun, and must ever remain so, because from the gums and from the alveoli of the teeth grow tumors of various significations; so various indeed, that while some are so malignant as to defy every remedy brought to bear upon them, others, as in the case before us, are so simple and benign that, as I have said, the extracting of a tooth, or, indeed, the simple obliteration of a carious cavity, will be all-sufficient for the cure.

If you have read much on this subject, you will necessarily have been struck with the fact that the most opposite conditions bear the common name; that authors dispute in every volume the benignity or malignancy of such growths; and like hundreds of others, you have perhaps turned from the subject feeling that, with all your efforts, you have failed to understand just what epulis is.

From the gums and from the alveoli of the teeth we have, as I have said, tumors of various signification; for example, some that are erectile in character, — others are the fibroid, the fibro-recurring, the semi-cartilaginous, the encephaloid, the pulp-fungoid, etc. Any or all of these growths are indiscriminately described by the common term epulis. Take as an example Mr. Fergusson's description: "Epulis," says Mr. F., "is a disease which begins as a small spot, either on the outer or inner side of the gums." Again, in another portion of his writings he says: "Epulis consists of a swelling of solid bone, the hard part of the bone being primarily affected." Still again: "Epulis is an osseous cyst, containing a glairy or a serous fluid."

Mr. Paget, on the contrary, quite ignores the existence of epulis. When you return to your homes, read his history of the myeloid diseases. Now, will I seem to use a paradox if I say that Mr. Fergusson is right in calling these most opposite conditions, as described by him, "epulis?" He has only in this case failed in his usual happy way of "putting things." So also the myeloid tumors, instanced by Mr. Paget as being mistaken for the epulides, being upon the gums, *επι ουλον*, must necessarily have been epulides, and those who disagreed with Mr. Paget, in calling them by such names, were right, — right in one sense, yet, also, was Mr. Paget right. The one class called them

epulic, because they were situated upon the gums, and it was their nomenclature thus to call all tumors so situated; the other class designated the growths pathologically. Now let us see how easy it is to reconcile these different nomenclatures of one and the same disease. I have already indicated that the word epulis could not, from its very derivation, apply as a noun-substantive; it has no other than an adjectival or anatomical application, and when so used, it is a remarkably expressive word.

Suppose, then, we discard the term as a noun, — as a word having any pathological signification, and apply it alone in accordance with its anatomical derivation.

Take now the tumors of Mr. Paget, — they were marrow-like in structure, and were therefore myeloid growths; but their situation was upon the gums, — they were therefore epulic; we convert now our noun into an adjective, and fully describe these tumors by calling them epulo-myeloid, — does not this reconcile the differences, and is not the compound word solidly expressive? An epulo-myeloid growth is a tumor situated upon the gums, marrow-like in its pathological character, — thus is expressed at once, and happily, as it seems to me, both location and character.

If now, gentlemen, you are prepared to accept of the change proposed, you can never again possibly find yourself confused by any writer or any *clinician* on this subject; he may call such tumors how or what he pleases, but you will comprehend him. You are, at least, to understand me that I shall never have an epulis to show you; but, without doubt, I shall have the opportunity of treating before you numerous instances of epulo-fibroid, epulo-erectile, epulo-cartilaginous, epulo-carcinomatous, and other tumors of the epulides. Epulis (*επι οὐλον*) is with us always, remember, an adjective and not a noun, — it describes the location of a disease, not its character.

I return now to the case before us. While, superficially viewed, this tumor looks as if growing from the socket of the molar tooth, yet I have found that, by carefully pressing it away, this is not the case, but that, indeed, it is nothing but a strangulated mass of gum tissue. Let me explain this. Here

in my hand is the model of a molar tooth; it has, as you see, a great cavity excavated in its side. Now, I encircle the base of the crown with this piece of lint, which lint is to represent the gum, and does not represent it exactly in its relation to the tooth,—look now, and you will see that the base of the cavity is concealed from sight by the lint,—the cavity runs below the circle of the lint. Suppose now that I should wet this lint, then, swelling, would not the portion that lies over the cavity fall into it?

This is exactly the history of the little tumor before us. The cavity in this tooth runs below the margin of the gum,—this gum tissue has become congested,—wet, if you please—and it has swelled up over and into the cavity, which swelling into the cavity, together with the pressure between it and the adjoining tooth, has strangulated the gum; hence its livid aspect; the strangulation in turn has added a second source of irritation, thus explaining through the provoked ulitis the congested look of surrounding parts.

Understanding now the explanation I have given you, the treatment of this case resolves itself into such simplicity that it is as though one might say, "I have a string around my finger which is so tight that it cuts off the circulation." You would cut the string, would you not? Just so you would pull out this tooth, or you would obliterate the strangulating cavity. If you would determine on doing the latter, you would first, with a sharp bistoury, cut the growth from the cavity, and then, saturating a piece of cotton with gum-sandarac, you would force it into the place just occupied by the removed tumor; two things cannot be in the same place at the same time, and you would be sure to cure the condition. A permanent cure, however, thus attempted, would have to be secured by a permanent filling up of the cavity. If convenient, the best way to accomplish this would be to send your patient to his dentist; but if this could not be done, then a piece of gutta-percha, sufficient to fill the cavity, might be softened in a flame and thus be packed into the tooth. A little cold water held in the mouth for a few moments would harden this, and it will sometimes last two or three years,

particularly if all decay has been removed from the parts before its introduction.

This, then, is a history and the treatment of one of the epulides; the other extreme will, sooner or later, compel me to resect the whole jaw before you.

Here is a specimen which I desire to show you. It is a model of a molar tooth,—an exact model, only hundreds of times enlarged. It has, as you see, a great cavity occupying the whole of the grinding surface; in this cavity is a red, fungous mass. The cavity communicates with the pulp, and the mass is the representation (often seen in practice) of a diseased hypertrophied pulp. Imagine now this pulp so overgrown and fungous as to bulge out over the tooth; covering it, as a thimble covers the finger; concealing it indeed from view, and hugging closely the surrounding gum. Do you not think it would be a very ugly sight, and, to one not having an understanding of it, would it not be confusing? Many a man has lost a section of his jaw for such a tumor, and yet for its cure nothing was demanded but the extraction of a tooth; this you certainly see, for the association of such a tumor is alone with the inside of the tooth, with its nerve or pulp cavity.

Here is still another specimen. You observe that on the side of one of the roots of this tooth is a hole. If the tooth was in the mouth, this hole would be the eighth of an inch at least below the margin of the gum. Out of this hole you notice the projection of a red fungous mass, precisely, indeed, like the last case, except that it is smaller. This is a pulp fungoid also. After a time such a growth will work its way upward to the free surface of the gum, and will deceive any one not very conversant with such things. You will diagnose such growths by observing the following suggestions: first, these tumors are invariably fungoid; second, they will be found to hug more or less closely the side of the tooth; third, it is possible, by gentle manipulation, to work down alongside of them until the origin is seen. To cure them, it is only necessary to extract the tooth. These growths belong to the epulides—they are epulo-pulp-fungoid tumors.

[*From The Chicago Medical Examiner.*]

FORM OF NEURALGIA OF THE JAW-BONES HITHERTO UNDESCRIBED.

By S. D. Gross, M. D., Professor Surgery, &c.

The seat of this affection is in the remnants of the alveolar process of edentulous persons, or in the alveolar structures of the overlying gums, and occurs mainly in elderly persons. It occurs most often in the upper jaw, and usually affects but a small extent of surface. The soft tissues in the immediate vicinity do not seem to suffer as in ordinary neuralgia, save in a slight degree. The morbid action is generally limited to the bone, although the gum may be, in rare instances, involved. The gum is nearly always hard and dense, grating under the knife, and adhering with great firmness to the atrophied alveolar process beneath.

The pain is generally paroxysmal, as in ordinary neuralgia, the slightest causes provoking it, as talking, masticating, the contact of hot or cold fluids, deglutition, or mental excitement. Sometimes it is momentary, occasionally it lasts for hours, and a few cases occur in which it continued with little mitigation for an indefinite period. The pain varies in character, and pressure relieves rather than aggravates it.

The pathology of the affection seems to be compression of the minute nerves distributed through the wasted alveolar process, dependent upon the encroachment of osseous matter upon the walls of the canals in which they are naturally enclosed. The osseous stricture is always abnormally hard from the deposit of new substances, which imparts to it an almost ivory-like consistence.

The disease comes on gradually, growing worse until the suffering is intolerable. The general health becomes eventually impaired, the appetite deranged, the sleep disturbed, the countenance anxious, digestion imperfect, bowels constipated, and the spirits much depressed. Sometimes the disease would seem to be of malarious origin, the attacks coming on periodically. The

professor gives a history of six cases which illustrate this disease, and the treatment he institutes for its relief.

The treatment consists in carrying an incision along the alveolar ridge over the painful structures, dividing and turning aside the soft parts, including the periosteum, and removing, by means of cutting pliers (constructed for the purpose), and the gouge, the affected bone to a level with the palatine process.

He has not found the bone at all diseased, and, from all his operations, recovery has been both prompt and complete.—[Am. Journal of Medical Science.

Mechanical and Miscellaneous Department.

AMALGAM.

Dr. James Lewis, in the November number of the *American Journal*, describes his mode of making and using amalgam, thus:

"Probably some of my readers know the *secret* of the *white* amalgams. The best of them have the silver alloyed with *cadmium* or *zinc*. For certain electro-chemical reasons, zinc is preferable. The part that zinc plays in the compound is to protect the silver and mercury from the oxidizing influences of the fluids of the mouth. Zinc being the most highly electro-positive of any of the metals that can be used in such preparations, commends itself on the electro-chemical theory as an important adjunct in amalgam compounds.

"Perhaps it may not be out of place to give my mode of preparing amalgam compounds. This I will endeavor to do as succinctly as possible, with my *reasons* for each particular. I prefer *coin silver* alloyed with *copper*. The presence of *copper* insures a greater degree of *hardness* than is attainable when it is absent, and in the presence of zinc it is as fully protected from electro-chemical action as the silver or mercury is. I melt the silver,

and if it be chemically pure I add copper, about 8 per cent. to the argento-cupreous alloy. I add, while in fusion, zinc, about 5 per cent., after which the metal is cooled as quickly as possible. The alloy is then reduced (by means of suitable cutters secured on a mandrel in a lathe) to fine cuttings, which are afterwards passed through a very fine screen or sieve of brass wire gauze. To this I add also about 5 per cent. of *similarly screened cuttings* of *metallic zinc*, which helps to impart the necessary electro-positive character to the mass. Finally, I add from 50 to 80 per cent. *chemically pure silver* in *atomic division*, regulating the amount empirically, as it seems to be needed on testing portions of the mass from time to time.

"I prepare my chemically pure silver by dissolving refuse silver, scraps and old plugs of amalgam in nitric acid. Filter the solution; add sufficient hydrochloric acid or chloride of sodium to precipitate all the silver as chloride, which chloride should be rapidly and thoroughly washed by frequent changes of pure water.

"The chloride is then covered with water, say half an inch deep, sufficient sulphuric acid and metallic zinc being added to insure the reduction of the chloride to pure silver. When this is fully accomplished, as may be known by the entire disappearance of the white chloride, and the flaky or granular appearance of the dark metallic silver, the zinc may be removed, and the silver remain a few hours in contact with the unappropriated sulphuric acid to insure the solution of any remaining undissolved portions of zinc. The silver is finally to be thoroughly washed with clean water, until *clean*, when it may be squeezed dry, or nearly so, in a napkin, after which it may be crumbled with the fingers, and more completely dried on a metallic plate over a lamp.

"The reason why I use chemically pure silver in atomic division is this: The *cuttings* of silver, no matter how fine, will have appreciable interstices between them, and an amalgam prepared from filings or cuttings alone will inevitably become porous by the process of saturation—the little fragments of silver being at first simply *coated* with mercury, finally absorb more, which necessarily drains the interstices. If, in the preparation of an amalgam, we can introduce some substance which will not greatly

disturb the homogeneousness of the mass, and which will displace as much mercury as possible, we shall have secured two advantages. First, we obviate porosity. Second, we have to use *less mercury*. And in the result we obtain a *condition* of the mass in which mercury is obviously not available to the extent observed in some other forms of amalgam, for the production of such salts as may act prejudicially upon the tissues in the vicinity.

"A few words relating to my mode of using this amalgam may not be out of place. Let the cavity be as carefully prepared as for a first-class gold filling. If the pulp cavity be endangered by the pressure necessary to insure a firm filling, cap with *osteoplastic*, or in any other mode that will secure permanence and security, dry the cavity by removing surplus saliva with a syringe, completing the process with any of the absorbents usually applied for that purpose. But, before the final drying of the cavity, mix the amalgam, and while it yet has a surplus of mercury, wash it with pure water, to which a few drops of ammonia (alkaline) have been added, until the amalgam is *perfectly clean*. Remove surplus mercury by squeezing in a napkin, or any other convenient, suitable material. The amalgam is now to be packed firmly in the carefully dried cavity, using a surplus, in order to take up and remove the free mercury forced out of the mass by condensation, taking care that this part of the operation is thoroughly and efficiently performed. Dress the surface of the plug to a *contour*, and burnish it. After the plug has become somewhat hardened the burnishing may be repeated until the surface remains bright and smooth. Plugs of this character, in an average mouth, retain their brightness and seldom di color a tooth—the *vitality* of which is sufficient to retain a plug of other material.

"In *dead teeth* discoloration is very liable to ensue. This may be explained by attributing it to the evolution of gases containing *sulphur compounds*, which, it is known, are often evolved in appreciable quantities, from the decomposition of organic substances, and more especially those of animal origin. I have omitted to enlarge upon some points in my remarks, where it appears to me facts and reasons are so obvious as to suggest themselves."

PREPARATION OF SPONGE GOLD.

DR. H. S. CHASE:

Dear Sir: —Enclosed find a copy of my specification. I will explain the circumstances which led to the discovery; last year I built a machine for making mechanical sponge gold, my object being to have the facilities of sponge and the properties of foil. With that machine I made ten thousand fibres a minute, each fibre the one-thirty-thousandth of an inch in thickness, and somewhat in the shape of a diamond or irregular parallelogram, transversely. These fibres would not adhere; I tried everything I could think of, as did, also, some of the best chemists in the country, but we found it was impossible to restore the gold to that plastic and soft condition which it possesses in its natural, pure state, because (as I think) the crystalline structure or grain was so crushed that annealing would not restore it. With foil produced in that manner, annealing to a heat that would soften it strengthens the angles, and brings it into a condition which gives rise to the familiar complaint of "stubborn and harsh" gold. It is impossible to make foil uniform, because the art of gold-beating is not the beating, but the order of the tools, or *pressing the moulds*, which is only guess work.

I will leave my theory to your judgment, thanking you for your notice in the —— number of the JOURNAL, though you have been misinformed. Very truly yours,

GEORGE J. PACK.

(From the American Journal of Medical Sciences.)

MEDULLARY CARCINOMA OF ANTRUM.

Dr. Mears presented to the Pathological Society of Philadelphia the greater portion of the left superior maxilla, which had been removed by Dr. W. L. Atlee for disease involving the antrum. The following is the history of the case:

R. A., aged 53, native of England, occupation cattle-drover, has always led an active out-door life, and enjoyed the best

health. Two months and a half since, on his return home from a visit to the West, during which he was exposed to many hardships, he experienced pain in the left temporal region, extending down to the upper jaw, and felt most distinctly over the site of the antrum. The pain was severe and lancinating, and was thought to be due to neuralgia. Subsequently, the three molar teeth were extracted, under the belief that the pain was due to some disease of the nerves connected with these teeth. Soon after the extraction of the teeth, he felt a tumor projecting into his mouth. This tumor increased in size very rapidly, encroaching upon the cavity of the orbit of the eye to such an extent as to produce very marked exophthalmia. The rapidity of growth of the tumor clearly indicates its malignant character; it possesses the gross appearance of infiltrated medullary carcinoma. The tumor was referred to the Committee on Morbid Growths, which reported that the tissue presented very numerous cells of rounded shape, varying greatly in size, and containing one, two, or even four comparatively large nuclei. The cell contents were markedly granular, and in some instances mixed with fatty granules. There was in addition much free oil, and occasional small plates of cholesterin. A few compound granule cells were also seen. The tumor appears, therefore, to be of an encephaloid nature.

NEW JERSEY STATE DENTAL SOCIETY.

Pursuant to a call signed by twenty-seven dentists of the State, the Convention met at Trenton, October 25, 1870.

Dr. Fowler was called to the Chair, and Dr. Hawks selected as Secretary, *pro tem.*

A committee was then appointed to report a Constitution and By-Laws for the use of the Society, viz.: Drs. A. W. Kingsley, J. Hayhurst, and C. S. Stockton, who subsequently reported a Preamble and Constitution, which declares among the objects of this Society, to cultivate the science and art of Dentistry, and all collateral branches; to elevate and sustain the professional

character of dentists, and promote amongst them mutual improvement, social intercourse, and good will.

The officers are — a President, Vice-President, Secretary, and Treasurer.

Three classes of members are provided for: active, corresponding, and honorary.

Active members must be graduates of some Dental College, or have been in practice three years, including pupilage, subject to examination by the committee on Membership.

The Constitution and By-Laws were adopted, and an election of officers ordered, with the following result:

President — J. Hayhurst, Lambertville.

Vice-President — C. S. Stockton, Mt. Holly.

Secretary — E. F. Hawks, Rahway.

Treasurer — L. E. Reading, Trenton.

Dr. Kingsley moved that a vote of thanks be tendered Dr. Hawks for his services in bringing us together for so laudable a purpose.

Professors J. Taft, of Cincinnati, and J. H. McQuillen, of Philadelphia, were proposed as Honorary members, by Drs. Hawks and Stockton, respectively; also Dr. J. S. Latimer, of New York city, as Corresponding member, by Dr. Cosad, of Jersey city. They were all unanimously elected.

SECOND DAY.

The Society proceeded to business, by selecting Newark as the next place of meeting, second Tuesday, July, 1871.

Dr. Reading was authorized to present a notice of the meeting to the Trenton papers.

Dr. Stockton was selected to deliver the annual address at the next meeting.

Operative dentistry being the first in order, the application of the rubber dam was announced as the first subject of discussion.

Dr. Kingsley, by request, gave a clinic demonstrating its usefulness, remarking, at the same time, that if he were compelled to give up all he had learned in the last ten years, with the

privilege of reserving one thing, that thing would be the rubber dam.

The next subject was the advantages of the different methods of separating teeth.

Dr. Stockton separates the bicuspids of children after the method of Dr. Arthur, of Baltimore, and advised it in all cases of frail or very soft teeth.

Dr. Hawks objected to the V-shaped operations, on account of the packing of food between the teeth, causing inflammation.

Dr. Kingsley advocated a mixed practice, according to the demand of the case, relying on his judgment.

Dr. D'Lange separates incisors by packing cotton between them.

Dr. Hawks advocated quick wedging, using generally two wedges, one at the points, and one at the neck.

Dr. Stockton objected, from personal experience, on account of the severe pain.

Dr. Cosad thought the quick method preferable when judiciously applied, but when carried to the extent of throwing all the spaces into one, he agreed with Dr. Frank Abbot, the practice was villainous. After a few moments the pain passes away, leaving a numbness that is not unpleasant.

Dr. Dibble separates bicuspids by the use of the inverted V-shape.

Dr. Hayhurst separates with orange wood, applied by the patient. Objected to filling incisors, on account of the unsightliness of their appearance.

Mechanical dentistry was next taken up. Dr. Dean took the floor, and explained the method of taking impressions in plaster, as used by Dr. Wescott, of Syracuse. Dr. Chew fully endorsed the same.

Dr. Stockton, in very soft and flabby mouths, trims the cast in such manner as to allow the plate to rest firmly against the palatine surfaces.

On motion, adjourned to meet again the second Tuesday in July, 1871, at Newark.

E. F. Hawks, *Secretary.*

The Missouri Dental Journal.

A MONTHLY RECORD OF THE SCIENCE.

VOL. II.] DECEMBER, 1870. [No. 12

[*From the London Monthly Microscopical Journal.*]

ON THE REAL NATURE OF DISEASE GERMS.

By LIONEL S. BEALE, F. R. S., Fellow of the Royal College of Physicians, and Physician to King's College Hospital.

Before I proceed to describe the characters of the particles suspended in animal fluids, having virulent contagious properties, it is very desirable to draw attention to the minute particles of bioplasm, which may be demonstrated in many specimens of simple exudation. From this subject we shall pass on to the consideration of other forms of "exudation" which possess specific disease-producing properties. We shall find that by a careful microsopical examination of fluids which experience has proved to us to have contagious properties, facts of great interest are disclosed which have an important bearing on the question of the anture of the poison of contagious diseases. Many such fluids are clear like water, and quite as transparent when examined by the unaided eye only. When we come to subject them to examination with the aid even of the highest powers yet made, although solid particles are detected, and sometimes in great number, we observe nothing peculiar to these fluids alone — nothing would enable us to form any conception of the wonderful properties they possess — nothing that would attract the attention of the chance observer, or excite the interest of any one, who had not long and carefully studied the matter. Nevertheless, what we

are able to demonstrate is of vast importance, and with the aid of other observations and experiments, we may form, I think, clear notions of the nature and origin of these morbid poisons, and of the manner in which they produce their marvellous and oftentimes disastrous effects. Much yet remains to be disclosed, but we shall soon learn more if we will but work and think independently, and accept the teaching of facts, of observation and experiment, while careful to avoid being misled by the dogmatism of those who obstinately persist in asserting that *all vital phenomena* are to be explained by physics and chemistry, and try to make people believe that living organisms are mere machines constructed by force. All truly *vital* phenomena must necessarily be altogether out of the range of mere physical investigation. Nevertheless, to such extravagant lengths has the opposite view been carried of late, that it has even been seriously stated that he who refuses to look upon life as mere inorganic force, opposes investigation, and looks upon the structure of man's organism as a subject unsuitable for scientific exploration. It would be as reasonable to assert that a man who is to be a scientific investigator must commence by confessing his belief in the truth of a conclusion which has long been proved to be false by reason and observation.*

In spite of all the evidence adduced to the contrary, and notwithstanding the failure of all attempts to prove the vegetable nature of disease germs, Mr. Simon still adheres to this doctrine. He seems to place great reliance upon the extraordinary statements of Hallier, which have not been confirmed, and ought to be received with the greatest caution. In his report for 1869, Mr. Simon makes the following remarks upon this subject: — "Knowing that all contagia (as such) are distinct one from the other, and believing that each of them has its essence in the so-

* The physical theory of life is, however, less popular now than it was a few years ago. Quite recently, its strongest advocates have expressed themselves more cautiously than has been their custom hitherto. They have discovered that the "tendency of thought" is fast settling in another direction. They have, therefore, modified their statements without withdrawing them, and have made preparations for abandoning their position without acknowledging defeat.

called microzymes which it contains, we by implication impute to the microzymes that in different diseases they are not identical; and as we affirm them to be dynamically different, so also we assume that, under well advised differential experiments, other signs of their specificity may be brought to light, and for each sort of them a definite genesiology may be written." The learned author of this sentence appears to have accepted the doctrine that each contagious disease is produced by a specific vegetable organism. Now it appears to me that the arguments upon which this view is based break down as soon as they are analyzed and the facts advanced in their favor carefully investigated. This part of the subject has been already considered in my work "On Disease Germs: their Supposed Nature." It was also discussed in my "Report on the Cattle Plague," printed in 1866.

I will now pass on to consider the actual nature of the living germs in various "exudations," some specimens of which were described and figured by me as long ago as 1863.

Simple Exudation. — The transparent colorless fluid which moistens the surface of a superficial wound after it has ceased to bleed, is poured out from the capillaries, or from the lymphatic vessels, or from both sets of vessels. This fluid, besides containing albumen in solution, contains multitudes of minute particles of bioplasm, which grow and multiply outside as well as within the vessels. These form fibrin and matters more or less allied to it, and perform an essential part in the healing process, or in the formation of pus, as the case may be. These minute particles of living matter are present in the blood and lymph in countless numbers. They are concerned in the production of fibrous tissue outside the capillaries, a change which occurs in many pathological processes, and also in the production of pus corpuscles, and other "corpuscles" in the same situation, in disease. All "exudations" contain these particles of living matter. The following paragraphs are taken from a paper written by me in 1863: — *

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* "On the Germinal Matter of the Blood, with remarks upon the Formation

"When the capillary vessels are distended, as in that extreme congestion which soon passes into inflammation, a fluid which possesses coagulable properties transudes through the stretched capillary walls. It is probable that in such cases minute and narrow fissures result, which, however, are too narrow to allow an ordinary white or red blood corpuscle to escape, but, nevertheless, wide enough to permit many of the minute particles of the living or germinal matter (the existence of which in the blood has been already referred to) to pass through. The small protrusions upon the surface of the white blood-corpuscle might grow through the capillary walls, become detached, and pass into the tissue external to the vessels. Such minute particles of living matter external to the vessels, being surrounded with nutrient pabulum, and stationary, would grow and multiply rapidly, while a similar change would of course go on in the now stagnant fluid in the interior of the capillary. The result would be exactly that which is observed, *viz.* the presence of a vast number of cells like white blood-corpuscles in the interior of the capillary vessel, and immediately around its external surface, and sometimes these extend for some distance in the substance of the surrounding tissue, and they increase in number.

"I venture, then, to conclude that many of the clear fluids which have been considered as '*exudations*' from the blood, really contain a multitude of extremely minute particles of living matter, which are intimately related to the white blood-corpuscles, and that these grow and become one source of the small granular cells or corpuscles which are so familiar to all who have studied morbid changes in the tissues as they occur in man and the higher annimals.

"Some of these active living particles may be so small as to be invisible by a power magnifying five thousand diameters. I have seen such particles, less than the fifty-thousandth of an inch in diameter, and have no reason whatever for assuming that these are really the smallest that exist."

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of Fibrin." Microscopical Society, December 9th, 1863. See Transactions Microscopical Society, April, 1864.

These minute particles of bioplasm multiply freely, but they may also be derived from the white blood-corpuscles, and from other forms of bioplasm. As the blood coagulates they undergo change, die, and help to form the non-living fibrin. In every clot numerous white blood-corpuscles, also composed of living matter, can be detected. In coagulation it is probable that the most minute particles of bioplasm change first, and become fibrin. After a time the white blood-corpuscles also die, and thus the coagulum of fibrin continues to increase for a short time after coagulum has commenced. The lines round the red blood-corpuscles seen stretching from one to the other in a drop of coagulating blood indicate the earliest stage in the formation of fibrin. The minute particles of bioplasm may be seen actualy undergoing change. The bioplasm of the blood is derived from the bioplasm originally found in the vessels of the germinal area at a very early period of development, from the bioplasm of the capillary walls, which is very abundant in some capillaries, and projects into the cavity, and from the lymph and chyle bioplasm which is being continually poured into the vascular system and mixed with the blood.

If the clear transparent material which moves around the cells of *Vallisneria* and other plants, be carefully examined under very high powers, magnifying upwards of two thousand diameters, it will be discovered that this is not a simple fluid like water, containing the nucleus and chlorophyl. But the apparent fluid has suspended in it an infinite number of particles of living matter, like those of which the amœba, white blood-corpuscle, and other forms of living matter consist. With high powers the slightly opalescent appearance may be detected, and by careful focusing, the minute particles of living matter will be brought into view. The movements of the fluid may, therefore, be compared with the movements of the bioplasm of an amœba. In the circulating juice of many plants similar appearances may be observed, and in the fluid of all animals, and in man himself, minute particles of living matter are to be demonstrated in immense multitudes. These are diffused through the fluid, and to them is probably due the movement of the contents of the finer vessels

and spaces. This constituent of the blood, seen with such difficulty that its presence is not yet admitted by observers, is probably the most important, for its increase or dimunition may occasion serious disease or death. This almost impalpable living matter is the seat of many very important changes, and is perhaps influenced before any other constituents of the body when certain poisons and disease germs find their way into the blood. "Protection," after successful vaccination, and the escape from a second attack, which is the rule in the case of many contagious fevers, is most likely brought about by changes induced in the living matter under consideration.

In health it is upon this material that the coagulable property of the blood is mainly dependent, and it is this which in great part undergoes conversion into what we call febrin, when the blood is removed from the living vessels or "dies." If destroyed it may, under favorable circumstances, be renewed by the appropriation of nutrient matter. The white blood-corpuscles are intimately related to this living bioplasm, and take part in its formation. I believe they bear to it the same relation as the "nucleus" in the cell of Vallisneria bears to the living particles suspended in the fluid, while the red blood-corpuscles of the blood correspond to the chlorophyl particles in the rotating fluid contents of the vegetable cell. Attention will presently be drawn to the vast importance of this living fibrin-forming matter in various exudations, and it will be found that a simple explanation of many most important morbid phenomena may be given. Now in the fluid exudation or virus which produces a "poisoned wound" when inoculated we also find minute particles of living bioplasm.

Many arguments will be advanced herein in favor of the view that the virulence of the poison is due entirely to the living particles, and not to the fluid in which they are suspended. In the case of some of these poisonous fluids we are able to study the production of the contagious virus, and we may even in some cases succeed in tracing out the manner in which the material with the wonderful poisonous property originates.

In some forms of inflammation of serous membranes the pro-

cess may be made out, and a conception formed of the several changes which occur, and at last end in the development of the poison. The morbid change is sometimes limited to the effusion of serum and the production of "inflammatory lymph," but in other instances the inflammation proceeds to a further stage, and actual pus is generated. Peritonitis is an example of an inflammation which much more frequently proceeds to the formation of pus than inflammation of other serous membranes. The greater vascularity of the peritoneum as compared with allied textures may perhaps account for this fact. It is interesting to discuss briefly the characters of the different "inflammatory products," as they are called, resulting from peritoneal inflammation, varying in intensity.

In *slight inflammation* there is great vascular distension, accompanied as in other cases by the escape of exudation in which are suspended particles of bioplasm. The exudation coagulates upon the surfaces of the serous membrane, perhaps glueing them together. The fluid portion is gradually absorbed, and if the case progresses to recovery, much of the coagulated matter is also taken up, a little being transformed into fibrous tissue, resulting in a few "adhesions," or mere thickening of the serous membrane, as the case may be.

When, however, the intensity of the inflammation is more marked, the little particles of bioplasm originally derived from the white blood-corpuscles, grow and multiply, and with the fibrinous matter in which they are entangled, form transparent flocculi, which are suspended in the serous part of the exudation, or adhere here and there loosely to the peritoneal surface. Many of these flocculi are found to contain multitudes of bioplasm particles, and oftentimes a vast number of these are suspended in the fluid, and congregated here and there, form little collections upon the surface of the delicate serous membrane, to which they adhere and where they grow.

If the inflammatory process still continues, and increases in severity, the vascular congestion becomes more marked, and the exudation is poured out from the blood more abundantly; the masses of bioplasm increase in number yet faster, and the exuda-

tion in consequence appears nearly opaque. The flocculi are of a yellowish color, and look very like pieces of clotted cream which stick here and there to the peritoneum, covering the intestines and the inner surface of the abdominal parietes. Not unfrequently the surface is smeared over in places with whitish pasty masses of soft cream-like matter, in the intervals between which the highly-injected vessels stand out with great distinctness. The masses of bioplasm would now be called *pus-corpuscles.* Here, then, is an interesting example of the production of pus-corpuscles by the rapid growth and multiplication of particles of bioplasm which were once in the blood, and intimately related to the white blood-corpuscles.

But further: if, as is well known, a little of this material were to be introduced into the body, as may unfortunately happen from a dissection-wound in the course of making a post-mortem examination, terrible inflammation may be excited in the person inoculated. The most tiny morsel of this virulent, rapidly-multiplying morbid bioplasm, may end fatally and in a very short time.

In some cases similar poisonous particles which have been derived from a diseased organism are so very minute and light that they are supported by the air, and may find their way into the blood of a healthy (?) person through his respiratory organs, or may gain access to his circulating fluid by traversing the narrow chinks between the epithelial cells of the cuticle.

Nature of Virulent Disease Germs.—Now what is the nature of the matter inoculated, which produces these dreadful results? The virulent poison which sometimes destroys life in cases of dissection-wounds cannot be attributed to the presence of vegetable germs, for the period of its most virulent activity is very soon after death, but before the occurrence of putrefaction, when the vegetable fungus germs multiply. A punctured wound is not dangerous if putrefactive decomposition has taken place, because, although bacteria are developed in immense numbers, *the real contagious virus is dead.* The vegetable germs, in fact, grow and flourish upon the products resulting from the death of the dangerous animal-living poison. In short, this material is living

and very actively-growing germinal matter; living matter which retains its life after the death of the organism in which it was produced has occured; living matter which has descended directly from the living matter of health, but which has acquired the property of retaining its life under new conditions; living matter destroyed with difficulty, and possessing such wonderful energy that it will grow up and multiply when removed from the seat of its development and transferred to another situation, provided only it be supplied with suitable nutrient pabulum — and it is to be feared the ordinary nutrient fluids of a perfectly healthy organism are eminently adapted for the nutrition of this destructive virus.

The Pus of Purulent Ophthalmia — Gonorrhœal Pus. — Such is the vitality of these forms of bioplasm that they will grow and multiply upon certain mucous surfaces if placed there; not only so, but the living particles will retain their vitality for sometime after their removal from the surface upon which they grew. They may even be transported long distances by the air, or they may remain for some time in moist cloths without being destroyed. When once a room has been infected with such particles, some weeks may elapse before the death of all the specific disease-carrying germs has taken place.

The pus possessing specific contagious properties cannot be distinguished from ordinary pus. It differs indeed from this last but not in appearance, chemical composition, or physical properties. It differs in *vital power*.

Vaccine Lymph. — Vaccine lymph which has been just removed from the growing vesicle will be found to contain a great number of extremely minute particles of bioplasm, which may be well seen under a power magnifying one thousand to two thousand diameters. In 1863 I made a drawing of the appearances I observed in the bioplasts from a drop of perfectly fresh lymph which had been transferred to a warm glass slide, and carefully covered with very thin glass under the $\frac{1}{26}$ object glass, which magnified about one thousand eight hundred diameters. The results are represented in the plate accompanying a memoir which was published in the "Quarterly Journal of Microscopical Science," for April, 1864.

In vaccine lymph which has been kept for some time in glass tubes, multitudes of very minute particles are observed, and these exhibit the most active molecular movements. These particles have often been termed *débris*, and have been regarded as quite unimportant elements of the lymph. To them, however, the active properties of the lymph are entirely and solely due. And I should be no more inclined, in the absence of the most positive evidence to the contrary, to regard the fluid portion of the vaccine lymph as the active material, than I should be to assume that the fluid in which the spermatozoa were suspended was the fertilizing agent, and that the spermatozoa themselves were merely epithelial *débris* and quite unimportant; or to infer that the fluid in which the yeast fungi or bacteria were growing was the active agent in exciting fermentation, while the actually growing, moving, and multiplying particles were perfectly passive. The germinal particles in all cases are, without doubt the active agents, and it seems to me as much opposed to the facts of the case to maintain that the *materies morbi* of cattle plague and other contagious fevers is a material that can be dissolved in fluid, and precipitated and re-formed, or sublimed as a volatile substance, as it would be to look upon any living organism as the result of the concentration of an albuminous solution, and capable of resolution and precipitation.

The little particles I have represented in my drawings could not be distinguished from the minute particles of living pus, or other germs of living germinal matter, and I think they consist of a peculiar kind of living matter, the smallest particle of which when supplied with its proper pabulum, will grow and multiply, giving rise to millions of little particles like itself, each having similar properties and powers.

I consider it to be almost certain that the material of which these particles are composed has the power of forming matter like itself from pabulum around it, which differs from it in properties and composition. Such living germs may pass from the organism on which they grew to another, and will grow and multiply there if they meet with the proper pabulum. The only condition in which matter is known to exhibit these powers of self-multiplication is the living state.

M. Chauveau* described these same bodies in 1868. It is evident he had not seen my observations, published in the Cattle-Plague Report, or my previous researches published in the Microscopical Transactions for 1863.† Chauveau showed that the active particles subsided after forty-eight hours, and that no effects were produced by inoculating the albuminous supernatant fluid, while the full effects were produced by vaccinating with the deposit. As would be supposed from the excessive minuteness of these bodies, they are not to be separated by ordinary filtration, but if the fluid containing them also contains a trace of coagulable fibrin diffused through it, this by contraction after coagulation would filter off the little bioplasts, and leave a serum perfectly free. Dr. Farr calls the living particles *biads* (*Bia*, force, *Bios*, life), and speaks of the vaccine particles as *vaccinads*.‡ These words are better than *microzyme*, adopted by Mr. Simon and others, because they involve no theory save that the particles are *living*, while the latter term affirms them to be of the nature of a ferment acting like yeast.

The circumstance that vaccine lymph retains its activity if kept in a tube for several weeks, seems conclusive as to the possibility of the particles retaining their vitality for a considerable time after they have been removed from the place where they grew; the arguments advanced, as proving that the active power resides in the particles and not in the fluid, being admitted. It is not more difficult to explain the fact that such living particles may be dried without losing their power, than that an amœba or rotifer should exhibit the same peculiarity. As this property is observed in connection with many of the lower forms of life, we might almost anticipate that the living matter from the highest organisms, if reduced to a degraded condition, would retain its vitality under circumstances which would cause its death in its normal condition. Yet it must not be supposed that

* Comptes Rendus, February, 1868.

† "Beale had, before Chauveau, declared that the 'active properties of vaccine lymph are entirely and solely due' to these corpuscles. He has figured them."—[Dr. Farr, "Report on the Cholera Epidemic of 1866," page 68.

‡ "Report on the Cholera Epidemic of 1866," page 70.

these particles, any more than the "dried animalcules," are really dried. Some moisture is retained by the particles within the imperfectly dried mass. Complete desiccation will destroy life in both cases. Since it has been shown that the active powers of vaccine lymph reside in the minute particles of living germinal matter, and if it has been proved that these may be dried (imperfectly) without loss of power, it is surely not too much to conclude that the *materies morbi* of other and allied contagious diseases is probably composed of living particles, which have the same property of living for some time in a state of partial desiccation.

Living Germs of Variola. — I have examined the contents of the little vesicle which rises in small-pox, at different stages of its development, and find, as in allied pathological changes, vast multitudes of minute particles of living matter or bioplasm, but, as will have been anticipated from what has been already said, these present nothing peculiar or characteristic, nothing that would enable us to say, if we saw these particles under the microscope, that they were obtained from a small-pox vesicle, and would certainly give no rise to that disease. I have made a drawing of some of the varioloid bioplasts from a well developed vesicle on the fifth day of the disease, and also from a vesicle which was just making its appearance.

Living Germs of Fever. — As was shown experimentally by Dr. Sanderson, a mere trace of blood serum was sufficient to propagate cattle plague. A very small portion of blood or of the tissues of an infected animal had the same effect. Nay, the contagion is so subtle, that in this as well as in many other contagious diseases, the breath of the diseased organism contains numbers of the potent particles of poison, and in this manner the very air of a considerable space or even district may become infected.

In the blood in the smaller vessels, as well as in the mucous secretions of the mouth, intestinal canal, and in the milk of animals suffering from this disorder, I have found multitudes of minute particles of bioplasm, which as long as they remain alive, are, without doubt, disease-carrying particles.

The disease germs of many contagious fevers will retain their vitality in water and other fluids for a length of time, and there is reason for concluding that some of these poisons not only grow and multiply in media different from any in the organism, but that in the course of such growth and multiplication they acquire still more virulent properties. Dr. C. Macnamara has discovered that cholera poison in water, after exposure to the sun for a few hours becomes extremely virulent, and at this period corresponds with the development of multitudes of vibrios; but that after the lapse of a day or two, when the vibrios will have disappeared and given place to ciliated animalcules, the fluid may be taken with impunity.

Syphilitic Disease Germs. — This is another of those remarkably spceial living poisons which may be suspended in serum and other fluids, and retain its vitality for a length of time.

There is reason for thinking that a single epithelial cell may carry multitudes of active particles of syphilitic poison, one of which introduced into the blood or lymph of a healthy person would probably grow and multiply, and give rise to pathological changes characteristic of, and quite peculiar to this particular poison.

We know that the syphilitic poison may retain its specific characters in the organism for years, from time to time giving rise to local pathological phenomena, which are characteristic of this kind of morbid bioplasm. It is impossible from the facts of the case to arrive at any other conclusion than this: that a certain portion of the living matter remains in the organism, and that under certain favorable circumstances this grows and multiplies, producing disease. Particles of this viruleut poison may be transferred from the infected organism to a healthy one, and contaminate it, even many years after its introduction into the first had taken place. Of syphilitic bioplasm there are different kinds, giving rise to different pathological affections belonging to the sypilitic class. Indeed, some facts render it probable that there are several different species or varieties of syphilitic poison, instead of only one or two.

One very remarkable property of the poison of syphilis is,

that it may be re-inoculated into the same organism over and over again, until inoculation ceases to produce any specific effect. As soon as this is the case, it is said the organism is "protected." But such protection sometimes cannot be procured until successive inoculation has been practiced during several months, and, as has been remarked, the remedy is in many respects worse than the acquired disease, besides being on many grounds, quite unjustifiable.

Living Disease Germs in Secretions.—The living germs of many fevers pass from the blood into the secretions. The urine, the secretions from the mucous membrane of the nose, mouth, stomach and intestinal canal, contain them in large numbers. There is reason to think they may also escape in the secretion of the sweat and sebaceous glands. In the excrements there can be no doubt disease germs exist in vast numbers in typhoid fever, in cholera, and in some other diseases. Even in the milk, in the tears, in the saliva, they are present. Some of the living particles of contagious (?) bioplasm in the milk from a cow suffering from cattle plague are represented in my Report, as well as particles of bioplasm and fungi in vaginal mucous from another animal suffering from the same disease. The spherical form, sharp, well-defined outline, and the high refractive power of the envelope of the fungi, positively distinguish them from disease germs.

Living tuburcle germs will not be considered as very closely related to the contagious particles which are the active agents in the propagation of contagions fevers. There is, however, reason to think that particles of living growing tubercle exist sufficiently minute to be supported by the atmosphere and carried long distances; while there are many facts which are considered by some sufficiently conclusive to justify the opinion that tubercular disease of the lungs is, at least in some instances, *contagious*. And it is certain that the most recent observations in connection with the subject of the nature and the mode of propagation of tubercle, so far from militating against this view, tend rather to support it. That tubercle is not eminently contagious is certain, while the probabilities of minute particles of living growing tu-

bercle escaping into the air while it remains in the air-cells of the lungs, or rising in a living state into the atmosphere from the sputum after its expectoration, are not great. At the same time neither circumstance can be regarded as impossible, neither view held to be untenable.

The manner in which the bioplasm of tubercle multiplies may be studied in tubercular inflammation of the membranes of the brain: The living matter may be seen extending round a small artery in the areolar tissue of the external coat. The living particles obstructed in the vessel make their way through its lining membrane and between the fibres of the muscular coat, until they reach the areolar tissue ouside, where they grow and multiply. By their accumulation, the pressure upon the vessel becomes greater, and at last its calibre will be completely obliterated. From such tubercle collections minute germs may be readily detached, and after having found their way into a pervious lymphatic vessel, or blood capillary, might be carried to distant parts and grow there. In this way tubercles are formed in many different parts of the body and in the substance of many different tissues and organs. If a particle of fluid, holding tubercle germs in suspension, were introduced by inoculation into a healthy organism, the disease might be produced.

Cancer Germs. — While it is almost certain cancer might be introduced by direct inoculation into the organism of a healthy person, many circumstances render it in the highest degree improbable that living germs detached from the growth could, under any circumstances, gain access to another organism through the air breathed, or in any other manner pass into the blood or tissues, as long as the surface remained uninjured. Cancer germs would probably live for some time in animal fluids out of the body, and it is by no means impossible that we may succeed in growing them in glass vessels away from their natural seat of growth, and watch the changes which occur, under our microscopes; but it is exceedingly doubtful if these germs would long retain their vitality if removed from the fluid which nourished them.

Between the cancer germ which cannot be conveyed in the air

from the diseased organism to one not infected, and the germ of scarlatina, which will retain its vitality for weeks after it has escaped from the organism in which it was produced, and may readily gain access to the healthy organisms in the air they breathe, we have examples of living disease germs manifesting powers of retaining their vitality when free in many different degrees. In other words, these poisons differ remarkably in the facility with which they are propagated, or spread from person to person. All exhibit the same appearances, though they differ remarkably in power. The capacity for resisting death, due to some inherent power and not to their chemical composition, varies much, some being capable of living for weeks or months away from the fluids of the body, while others die within a very short time after their removal from the seat of growth.

WHAT IS A CELL?

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In entering upon the consideration of this subject, we would state that it is no part of our object to describe the physical or chemical properties of the cell, nor to dwell upon its special morphological characteristics, but simply to enquire in relation to the proper use of the word in its histological significance.

The first inquiry which presents itself for solution is, What determines the proper use of a word? and this leads us at once to a consideration of the philological laws which have a direct bearing upon this question. Fortunately, there does not seem to be any disagreement among philologists upon this point, so it will not be difficult to arrive at a satisfactory solution of this question. There is a common adage, in relation to the proper use of words, which declares in substance that custom alone determines their proper use. This, however, does not exactly

accord with the same adage as it was quoted by Quintillian, one of the most celebrated educators of the Roman youth, who declared that it was the custom of the *best speakers and writers* of the age which determined the correct use of words; and this accords precisely with the philological doctrines of the present day. We would likewise premise, that words often change from their primary signification to such an extent, that their etymological meaning is entirely lost sight of. Numerous instances might easily be adduced to demonstrate the truthfulness of this proposition.

The word pen, for instance, was derived directly from the Latin "penna," signifying a feather or quill.

As the quill came into general use in writing, after the stylus was laid aside, and as it was used for this purpose alone, the general idea of an instrument for writing became gradually attached to the word, so that when the quill gave place to a metal instrument, the name "pen" followed the instrument which now performed the same office which the quill had so long performed, and the word has therefore at the present day lost entirely its etymological signification, and conveys to the minds of most readers no idea save that of an instrument for writing.

It is evident that the "best writers and speakers of the age" frequently make use of words in a sense which has widely diverged from their original signification, as evidenced by the above example, and we must therefore look upon such usages as proper and correct.

Let us therefore examine the word *cell*, as used by histologists, and determine by the aid of the rules laid down above, its proper application.

As pen is directly derived from the Latin penna, so cell is derived from the Latin cella, signifying a chamber, a closet, or a cavity, and its first use by histologists was undoubtedly suggested from its etymology, and it was therefore defined by Schleiden and Schwann as a sac, enclosing in its cavity fluid contents, with a nucleus and nucleolus.

It was, however, the *doctrine* of Schleiden and Schwann in relation to the cell, which gave it its prominence in the eyes of

histologists. They declared that the cell was the "elementary part" from which all living beings were formed, or, as Virchow more tersely describes it, as "one of those really elementary bodies, to be built up of which is eminently characteristic of every living being." The idea of an elementary part, or body, became soon the leading characteristic of the cell, and this has finally decided its fate, as to its future use, inasmuch as its etymological signification "of a cavity or closed sac" is fast being lost sight of.

Keeping in view only this all-important fact, that the cell was the "really elementary body," Virchow did not hesitate to declare that a cell need not of necessity have a nucleolus—as soon as he had come to the conclusion that all elementary parts were not provided with a nucleolus; and Max Shultze, following the same course, declared that a cell might be without a wall, though this had before been announced by Leydig, and perhaps by Remak, and has been essentially concurred in by Beale, and many others.

This declaration was a result of observations which had demonstrated that the elementary part was not always enclosed in a membranous wall.

Brücke went still further, and applied the word cell to a mass of protoplasm, declaring that elementary parts and even living beings exist, which consist only of protoplasm without a nucleus, so that the definition of Max Schultze, which defines a cell as a "mass of protoplasm enclosing a nucleus," is simplified still more by Brücke. Stricker, the editor of the "Hand-book of the Histology of Man and Animals," also endorses the views of Brücke, and cites the fact that Max Schultze has discovered a non-nucleated, amœba and Hæckel a non-nucleated protozoon, &c. This nomenclature has therefore been made use of, and endorsed as correct, in the "Hand-book of Histology."

We would remark in relation to these views of Stricker and Brücke, that they are but one step in advance of those promulgated by Leydig, Max Schultze and others, and seem to have been necessitated by the progress of science, and have been acquiesced in generally as soon as they were enunciated and the facts stated upon which they were founded.

In order to fully appreciate the weight of the doctrines which are found in the "Hand-book of the Histology of Man and Animals," we must bear in mind that it is the joint production of the labors of Stricker, Von Recklinghausen, Max Schultze, Pflügel, Kühne, Conheim, Brücke, and others, forming together a list of names which are known throughout the world as reliable and authoritive observers in the field of histological research, and second to no others in their general literary and scientific acquirements.

It is evident, therefore, that the most illustrious microscopists, the most finished scholars and scientists of the present time do make use of the term *cell* to designate the "elementary parts" of living beings, though those elementary parts may consist only of masses of protoplasm.

Operative and Surgical Dentistry.

INFLAMMATION OF THE ANTRUM.

TO STUDENTS.

The Antrum or maxillary cavity is of considerable size, you know, and extends on its buccal boundaries from the first bicuspid tooth posteriorly to the posterior roots of the third molar. Its floor is a portion of the palate, and its roof the orbit of the eye. Its inner wall forms part also of the nasal cavity, and its outer wall is continuous with the outer alveolar plate of the upper molar and bicuspid teeth. Its only opening is into the nasal cavity, and is a narrow and long one near the top of the maxillary sinus.

The Antrum is lined with mucous membranes of the same character as the nasal passages with which it is continuous, through the opening just spoken of, and which opening is very much reduced in size when this membrane is inflamed and swollen.

The mucous membrane of the antrum completely lines this cavity, and performs the same functions as the mucous membrane of the nose. Inflammation here is no different in character from that of the nasal membrane, and is often concomitant with it.

The roots of the molar and bicuspid teeth often penetrate the antral cavity in their growth, their ends of course being covered with their pericementum, and the mucous membrane of the sinus.

When the teeth thus situated become diseased, they are a prolific source of antral inflammations.

For instance, the pulp of a tooth dies, it disintegrates in its own cavity, the gases produced from its decomposition or putrefaction, pass through the foramini of the roots and create irritation and inflammation in the surrounding pericemental tissue. These roots penetrate the antrum and set up inflammation in its lining membrane. The first symptom of antral disease is a dull pain in that side of the face, and a dryness of the nostril of the affected side.

Now, you must know that in health the lining of the antrum assists by its natural secretion of mucus in keeping the nostril moist. So too, when it participates with the *nose* in inflammation produced by a "cold in the head," it furnishes its proportion of mucus and watery exudation which is so annoying in acute nasal catarrh.

The second antral symptom is this increased flow of mucus, which is the second stage of inflammation in mucous membranes everywhere.

You will be careful then, to examine the nostril of the affected side, in your diagnosis of this disease, so as to discover whether or not the nostril of one side corresponds in condition with that of the other.

Now you must not fail to understand that the opening from the antrum into the nostril may become so closed by inflammation and consequent swelling, that no fluid can pass through it. In this case then the fluid must remain in the antral cavity, as there is no other outlet. If this is really the condition of things, the contents will probably become purulent and there will be considerable pain in the face, redness of the cheek, and more or less swelling of the soft tissues.

If science is not called to relieve the patient at this stage, then the bones gradually become absorbed, and growing thin, bulge out, either on the buccal or palatine wall, or the orbital. Not unfrequently has the eye been pushed from its socket by this engorgement of the antrum. The osseous wall at last gives way at some point, and the pent-up fluid finds its way through the soft tissues to the surface, forming a fistulous canal and opening at almost any point on the face, even on the underjaw, so as to give rise in some cases to a supposition that one has to do with an alveolar abscess of that bone.

You must not suppose that this is the most frequent way in which antral inflammations progress and terminate. The antro-nasal opening is not so often closed, and then the muco-purulent secretion passes through the nostril, and is always to be found there in greater or less quantity. The best time to see it is after the patient has been lying down, with the head resting on the unaffected side. This position allows the fluid to run out of the cavity into the nostril.

In healthy constitutions this state of things may continne for months and even years without any general disturbance of the system, or without exceeding its present bounds. And it is often unappreciated, the patient supposing that he has only a nasal catarrh. This is more likely to be the case when the exudation passes into the posterior nares and drips into the fauces, instead of appearing at the nostrils.

The exudation in old cases, and repeatedly in bad constitutions is likely to become very offensive. The stench is sometimes intolerable; these cases are likely to be called Ozena.

In syphilitic, scrofulous, and scorbutic constitutions, antral inflammation is likely to be chronic and of the most offensive character.

I have already said that acute nasal catarrh is often the companion of antral inflammation; when the latter is dependent on the former, it is likely to cease when the cure of nasal catarrh is effected.

TREATMENT.

This must be on general principles. Remedies should always

be addressed to the general constitution of the patient, and also to that particular phase in which the constitution may be at the time.

For acute antral catarrh you may soak the feet in hot water to the knees. Give a night sweat; hot bricks to the feet and plenty of cold water in the stomach—five or six tumblers full. Blue mass pills of three grains each, at bed time, and a saline cathartic in the morning, may be useful. But my favorite treatment would be the third attenuation of aconite in the inflammatory stage, for half a day, and, if necessary, followed by mercurius vivus third dec. trit., two grains every hour until better. I have often relieved these cases with one dose of the mercury, and effected a cure in from three to four.

You should always examine the teeth of the affected side, and very carefully too, for the cause may lie in an *apparently* sound one. Press the tooth on examination, from side to side; rap upon it with an excavator handle; look between the teeth for a cavity of decay.

If you find the offending tooth, it will usually respond by pain—a sore feeling more or less extensive. But it may be there will be no pain, only a very considerable looseness of the organ.

It is surprising how the system comes to tolerate a dead tooth, which is causing a constant exudation of purulent fluid into the antrum for months, so well that no pressure upon the tooth produces pain, and yet it may have produced so much absorption in the surrounding tissues that it is loose enough to be extracted by the fingers. No hesitation should be used in the *extraction* of such a member, which done, there will probably follow a gush of purulent fluid.

Still you must not surely expect this to be the case, for there may be no opening from its alveolus to the interior of the antral lining mucous membrane, until you push an instrument through it.

Now then, take a crescent drill and explore the bottom of the socket; the bone may need to be drilled away to enlarge the alveolar opening into the antrum, but you may find only soft tissue at the bottom, instead of bony wall. Push through it and explore the antral cavity.

Instead of finding an open cavity here, you may find it to be more or less filled with a spongy mass, This is to be torn to pieces in every direction, if present, so that your cautery may act in all its parts where you introduce it.

Whether the cavity is thus filled or free—and it is more likely to be the latter than the former—you will syringe it out thoroughly; first with warm water, then soap and water. If the opening into the nose is patent, you will find much of the fluid injected escaping in that way. After this cleansing, throw into the cavity ten drops of kreosote in an ounce of tepid water. While using the kreosote you will protect the mouth from the regurgitation of the fluid through the alveolus; to this end you can pack some cotton or lint closely around the tube of the syringe, and when the latter is withdrawn, but little fluid will follow it.

To avoid its escaping into the nostrils, let the head be thrown towards the side upon which the extracted tooth was situated. This will bring the opening uppermost, and the cup will not so easily run over.

Instead of kreosote, tincture of iodine or chlorate of zinc may be used, but I prefer kreosote. Carbolic acid may be substituted for the latter, as there is but little difference between them.

A piece of tape should be crowded into the place loosely, to prevent its closing up too soon, which it is not likely to do if you see your patient the following day. You may expect some considerable pain to follow your operations, which will be increased the following day.

You had better *not* repeat the injections as soon as the following day, there is always danger of over-medication. Wait three or four days and observe the result of what you have already done. It may not even be necessary to give the cavity a second cauterizing injection.

I have already said that attention should be paid to the general system, and your remedies must correlate with the present dyscrasia of the constitution, whether it be syphilitic, scrofulous, anæmic. This paper would be unduly lengthened were I to particularize in regard to these conditions.

A wholesome and generous diet, however, is never at variance with purulent formations in the antrum.

Let us now suppose a difficult condition of things. For instance, there is no diseased tooth which causes this distrurbance! There is no decayed tooth on this side of the upper maxilla! What then? Shall we extract a sound tooth for the purpose of reaching the antral cavity? By no means; sound teeth are not thus to be sacrificed, notwithstanding the authority of surgical authors.

We can very readily penetrate the antrum through the thin wall above the roots of the second bicuspid tooth, or above those of the first molar. Take a strong gum lancet and make a V-shaped cut through the soft tissues in the place designated — the point of the V pointing downwards; then with a trocar or dental drill of large size, bore through the bone. You will find it not very thick—only from an eighth to the thirty-second part of an inch in thickness. Here you can institute your treatment as already directed, being careful to keep the opening patulous, by the use of a strip of tape. I recommend the use of tape instead of lint or cotton wool, for the reason that there is less danger of its getting lost in the antrum, such things have happened, and are not pleasant, as they complicate the case sometimes.

If tape should be lost, it can easily be withdrawn by getitng hold of one end with an excavator or tweezers. A lint of cotton or wool might be only withdrawn piecemeal, as it readily separates.

When this disease has been produced by foreign bodies in the cavity, as a dead root which has been forced into it in the operation of extraction, then the socket through which it was drawn is to be enlarged at the bottom with a large drill or burr, and exploration made from this point.

Don't be afraid of making too large an opening; there is no danger but what nature will supply with new bone as large a cavity as you choose to make. One large enough for the root to make its own exit from, easily, is the best.

In all these cases you will find mercury useful, in the manner previously described.

I will now detail a few cases occurring in my own practice, illustrating treatment, and which may be more interesting to you than general descriptions:

Case 1. Mr. B., age thirty, has had the second bicuspid of the left side extracted, thinking it diseased, as he had suffered much pain in that locality. The patient says the tooth extracted was not decayed. Pain continuing, he consults me. There are no decayed teeth on that side of the mouth. None feel sore by rapping them. There is, however, pain on pressing hard against the antral wall. There is, also, unusual dryness of the nasal passage of that side. I diagnose acute inflammation of the antrum. I drill through the vacant socket of the tooth extracted very readily, and syringe with warm water. There was no exudation of any character, when the drill was withdrawn.

Tincture of nut-galls with twenty drops of laudanum is now injected into the antrum, and a tent left in the opening until the next day, when I see the patient, who thinks he is considerably improved. No medication to-day, but cavity is syringed with warm water and tent left out.

Patient called again the fourth day improved; syringed with water and injection of tincture of nut-galls and laudanum. Sixth day patient discharged well.

Case 2. Mr. S., age forty, works in a flouring mill. Sent for me to extract the right upper second molar. I found it undecayed but tender on percussion. I examine right nostril and find some mucus in it, much more than on the opposite side. On enquiry, learn that there is much more in the morning after lying on his left side. Discharge not offensive to smell.

History.—Two nights ago, he worked all night in the mill, but took a nap, laying his head upon a bag of damp bran. He took a cold, too, as well as a nap, and got rheumatic pains in his limbs. It seems also that he got rheumatism in the tooth spoken of, that is, pericementitis, or periostitis. This, too, is the way he got inflammation of the antral mucus membrane. The roots of this molar undoubtedly penetrated the antrum.

Treatment.—Feet in hot water; go to bed with hot brick to the feet. Mercurius vivus, third decimal trituration, two grains every hour until better. Saw patient next day so much better that medicine was discontinued and patient discharged.

Case 3. Mrs. P., age thirty, scrofulous habit. Present con-

dition: considerable fever, left cheek swollen so as to nearly shut the eye, skin of the face inflamed and red. Left nasal passage obstructed so as to be unable to breathe through it. Slight constant discharge from left nostril of a purulent fluid, greenish color and very offensive. Left bicuspid and molar teeth covered with tartar so as to almost conceal them in the mass. Formerly had toothache a good deal on this side.

Diagnosis. — Inflammation of antrum from purulent periostitis, following death of a dead tooth which I will find under a mass of tartar. Probable total closure of the antro-nasal opening from chronic inflammation.

Treatment. — Removed tartar from the teeth. Find the first molar with crown cavity of decay extending to pulp, which has apparently long been dead. Extract the tooth, a gush of offensive purulent matter flows from the open socket. A large fungus mass covers the ends of all the roots. It is white, and is only a tumor of pericemental tissue. An opening almost as large as the crown of the tooth is found leading from the alveolus to the antrum. This cavity is syringed with soap suds, followed by kreosote — ten drops to an ounce of water.

Thursday. Considerable pain in cavity yesterday, better today, and scarcely any discharge; from the nose it has ceased. Can breathe through the left nostril freely. Injection of tanic acid and water. Fourth day, discharged cured.

Here was an alveolar abscess absorbing floor of antrum and filling cavity with purulent fluids which could be evacuated only by the nose.

Case 4. Mrs. G., washerwoman, age fifty; had some roots extracted from socket of left second molar, at a hospital. Intemperate habits. Syphilitic blood dyscrasia. Has had pain in face ever since the operation, three days since. Muco-purulent discharge from the socket now. Instrument readily finds its way from the socket of the palatine root into the antrum. She does not know whether this root was extracted or not. I suspect that it was forced into the sinus by the root forceps. The floor of sinus probably weakened by alveolar abscess, which she says she had there.

The alveolar-antral foramen is too small for explorations. I enlarge it with a rose drill of the largest size, and small chisels. Syringe the parts. Can now explore cavity freely, but find nothing. Fill cavity full of warm water and direct the patient to keep the head level, hoping as the water runs out through the alveolus it may bring root to opening. After three or four trials, am rewarded with success. The root comes out with the rush of water, not more than three-sixteenths of an inch long. It has some loose periosteal tissue about the end. Kreosote, five drops to an ounce of water, for injection. No other treatment was found necessary. CHASE.

FRACTURE OF THE TEETH.

Extract from a paper read before the Odontological Society of Great Britain, by JAMES MURIE, M. D., &c., &c.

Human dental fracture is so well known to you that my remarks thereon may be brief. When within the capsule, and transversely, repair often takes place. As Tomes has shown, some instances of the so-called "dilaceration" certainly come under this heading. In longitudinal fracture of the adult teeth, if extensive, the moieties seldom unite; and of not uncommon occurrence both in this case or in caries, protrusion of the pulp ensues.

During the discussion of my former paper to this society, Mr. Vasey spoke of the Hippopotamus in the Zoölogical Gardens, as in some respects interesting; expressing a wish that at a future time I might lay the case before you. I therefore take this opportunity of recording some remarks on it. But for a moment shall refer to the dentition in general of this great hog-like pachyderm.

The grinding teeth of each moiety of the jaws consist of three true and four false molars. The latter are more or less conical when unworn and moderately tuberculate as they are ground down.

The anterior premolar is small, the second, third and fourth increase considerably in dimensions. The three true molars are much larger, their crowns studded with cones. In the view of the open mouth of the male (above twenty years old) which I have given in plate 1, the molar series, upper and lower, appear small and the teeth much apart. This is caused by their being partially worn down, and partially hidden by the great buccal folds, retracted tongue, and spongy gums.

The great tusk-like canines, two maxillary and two mandibuluar, are more commonly known to your profession; and although broken and rubbed down in the animal in question are still formidable weapons of offence.

The incisors, four above and four below, are not in a line, the outer being placed rather behind the inner pairs.

The median thick porrect lower incisors, especially in the male Hippopotamus, are vast, and to these I more particularly direct attention.

The Zoölogical Society's animal while young was mild in temper, but as age advanced became more irritable. As all who have seen the creature know, he will at times approach the rail and with open mouth knash at the iron bars. Whether from anger or otherwise is not known, but on one occasion the brute had the misfortune, while smashing at the rails, to fracture longitudinally and splinter the right median lower incisor. Bleeding was profuse and the splinter apparently most troublesome. What further took place is best told in the Superintendent's own words, in a letter written to Mr. Frank Buckland:

"You will be glad to know that I have succeeded in performing, perhaps, the largest, if not the greatest, dental operation on record.

"Our male hippopotamus has been, as you know, suffering from a fractured tooth, and fearing that the consequences might be serious, I had a strong oak fence fixed between his pond and the iron railings, and I then determined to remove the broken tooth; this I accomplished on the morning of Wednesday last, but not without a fearful struggle.

"I had prepared a powerful pair of forceps, more than two

feet long; with this I grasped his fractured incisor, thinking, with a firm and determined twist, to gain possession of that fine piece of ivory. This, however, was not so easily done, for the brute, amazed at my impudence, rushed back, tearing the instrument from my hands, and, looking as wild as a hippopotamus can look, charged at me just as I had recovered my forceps.

"I made another attempt, and this time held on long enough to cause the loose tooth to shift its position, but was again obliged to relinquish my hold. I had, however, no occation to say, 'Open your mouth,' for this he did to the fullest extent; therefore I had no difficulty in again seizing the coveted morsel, and this time drew it forth, with a good sharp pull and a twist, out from his ponderous jaws. One of the most remarkable things appeared to me to be the enormous force of the air when blown from the dilated nostrils of this great beast when enraged. It came against me with a force that quite surprised me.

"A. D. Bartlett."

I, myself, was not present at this notable tooth extracting, and a period elapsed before I examined the mouth. By this time all acute symptoms had subsided, a mass of florid granular pulp had protruded, and the animal masticated its food as if nothing had happened. I have since noticed that at intervals bleeding occurs, and then in quantity. This may be from the spongy condition of the gums as much as from abrasion and irritation of the extruded pulp; for the fleshy substance around the canines and pro-molars likewise exhibits sanguineous oozing.

I have seen the splinter of the tooth which was removed. It is a solid piece of ivory, without any tendency to decay, and weighs thirteen ounces.

The deductions in the case of this hippopotamus apply, to a certain extent, to similar instances in the human teeth.

From whatever cause the pulp may be atmospherically exposed and extrude, it is obvious that its vitality is not lost, although notably it ceases to possess the power of reproducing dentine. From being tender, highly vascular and granular in the acute stage, it becomes callous and firmer; the growth of a toughish membranous exterior evidently protecting it from external injurious influences.

Very different is the case when the tooth is fractured, without exposing the pulp, even although the latter may have received very serious damage in animals where the pulp is persistent. Of these last I need only revert to the elephant's tusk with the spear-head driven into it. And to Dr. Malcomson's specimen of reunited fractured hippopotamus tusk, and described by Professor Owen, "Odontography," page 569, and plate 162, figures 1 and 2. Those cases of transverse fracture of the fang of a human tooth which reunites, and of the crown, when within the gum, the so-called "dilaceration" are excellent examples, to-wit, in non-persistent pulp. Furthermore, in man, Mr. Salter's three kinds of secondary dentine (repair, excrescence, and osteal), which he has so lucidly demonstrated, prove beyond doubt that a compensating reproductive growth of dentine follows various lesions, provided the pulp cavity is not opened.

Finally, there seems a resemblance, though the parallel is not absolutly complete, between a simple and compound fracture of a long bone, and a deeply situate transverse and entire longitudinal fracture of a tooth.

MEDICINE IN INDIA.

At a special meeting of the Hunterian Society, in London, Dr. Baboo Chunder Roy gave the subjoined account of medicine in India, which we take from the *British Medical Journal:*

"The physicians of India had sprung from two of the castes —the Brahmins, who were the most educated, and from whom the priests were chosen, and the Boyshos, or traders, who were not allowed to learn the Sanskrit or to reach the higher education of the Brahmins. Medicine and Surgery were distinct; the latter being entrusted to barbers, whose operative skill was very limited. Medicine was from very ancient times divided into anatomy, materia medica, and the treatment of diseases. The study of anatomy was very imperfect, in consequence of

the prejudice against handling dead bodies. What knowledge of anatomy the Hindoo possessed, was gained from the dissection of goats; and an acquaintance with the human skeleton was obtained by allowing bodies to remain in water till the bones and ligaments alone were left. The umbilicus was supposed to be the centre of the vascular system. The blood was regarded as a mixture of humors. The materia medica attracted attention at an early period; and the articles were described with a view to their diatetic as well as to their therapeutic properties. Mercury, arsenic, iron, and several other mineral remedies were known in Hindoo medicine many centuries ago. Gold dust entered very extensively into the formulæ; perhaps not so much for the sake of increasing the therapeutic value of the medicines, as their cost. Sesquioxide of iron was the chief basis of tonic remedies. Arsenic had been long used in the treatment of intermittent fever. There were a large number of remedies belonging to the vegetable kingdom in use in India from remote ages, some of which, as bael, chirayta, etc., had been received into the *British Pharmacopia.*" Baboo Chunder Roy recommended a "careful investigation of Indian medicinal plants; believing it probable that among them would be found some valuable remedies for the prevalent diseases of the country. In the works on practice of medicine, the description of symptoms was very exact, but the treatment was very empirical. In fevers, low diet was enjoined; the patient was kept for forty-eight hours without medicine; then bitters and purgatives were administered; and then if the fever persisted, arsenic in divided doses. This treatment rarely failed to arrest the disease in ten days; but it left the patient's constitution in an impaired state. Surgery was in old times entrusted to barbers, whose practice was limited mostly to the treatment of ulcers, abscesses, &c. But for ages there had been persons who had performed the operation for depression of cataract, cupping (by means of cow's horns), bleeding (in the calves of the legs), &c. Hygiene had long held a place in the Hindoo system, being mixed up with religious rites. Washing in the Ganges was thus made a religious ceremony. The flesh of an ox was forbidden, on account of the use of the

animal in agriculture, and of the cow in yielding milk; and that of the pig on account of the filthy habits of the animal. Dry earth had long been used for removing offensive smells. Change of climate, in the form of pilgrimages to distant lands, had long been a remedy in chronic diseases. With all this there was an ignorance of some of the fundamental principles of hygiene. Poison and pure air were placed in the same category; and a Hindoo sick room was rigidly closed at all points."

Mechanical and Miscellaneous Department.

(From the Boston Medical and Surgical Journal.)

THE ANGLO-AMERICAN AMBULANCE IN THE EUROPEAN WAR.

Some weeks ago we published portions of a letter, from Drs. Evans and Crane, on the organization of the American Ambulance. We had hoped to give our readers occasional information of the operations of this Society; the exigencies of the war, however, have shut us off from communication with either of these gentlemen, and the information we have been able to glean is but fragmentary. We are glad, however, to find in the Medical Times and Gazette reports from Drs. Sims and McCormac, from which we make extracts:

"The Anglo-American Ambulance has a little history of its own. The Americans in Paris appointed a committee at the beginning of the war to organize an ambulance. This committee invited me to select a staff of American Surgeons for this purpose. I accepted the invitation and organized the staff. When we reported ourselves ready to go forward to the seat of war, the committee suggested that we should set up our tents in Paris, and await the coming of the Prussians. The Surgeons

unanimously opposed this proposition, insisting that our organization was for the purpose of giving aid and succor to the sick and wounded on or near the field of battle. The committee was obstinate—the surgeons no less determined—hence a split, and the American Surgeons dissolved their relations with the American committee, and formed a union with Dr. McCormac, Dr. Frank, Dr. W. Webb, and other English friends, under the title of the Anglo-American Ambulance. We then went to the French Société de Sécours aux Blessés, in the Champs Elysées, where our services were at once accepted." * * * * *

"I was made Surgeon-in-Chief, and Dr. McCormac was placed next in command. Dr. W. Webb was *comptable*, which includes the functions of commissary and paymaster. Thus organized, we left Paris on Sunday night, August 28, with orders to report at Mézières. We arrived there on Monday night, and on Tuesday, the 30th, we came to Sedan, where we found the Caserne d'Asfeld already converted into a hospital, which the mayor gladly turned over to our use, and we took possession of it on the 31st. We had barely entered its grounds when the roar of cannon announced the battle of that date. At night most of us repaired to the battle-field; many of the wounded were transported to our hospital at Sedan, but many more, too severely wounded to be transported, were housed in the village of Balan. Several urgent operations were performed that night by McCormac and Frank."

The good fortune which placed Dr. Sims in charge of the hospital at Sedan enabled the Anglo-American Ambulance to render services, such as no other ambulance in either army had been in a position to perform during the war. The number of patients treated by them was 1193; of these the total number of deaths was 117. Considering the circumstances under which they were placed, Dr. McCormac thinks, and justly, as we believe, that this death rate is small. He attributes the good results obtained, to open windows and the liberal use of carbolic acid. Of the number of deaths, thirty patients succumbed to pyæmia.

Dr. Sims says, "Without invading the province of Dr. McCormac's report, I may mention the fact that we never used the

tourniquet at all; hence our patients lost but little blood during operations, and we never had a case of secondary hæmorrhage, which is remarkable, considering the number of operations, and the seeming haste with which they were sometimes done." * *

"Free ventilation by open windows is not the plan in general use in French hospitals. About ten days after the battle of the 1st, all the ambulances and hospitals in Sedan and its neighborhood were visited and inspected by a committee of French surgeons. As they entered ward No. 1, in our hospital, they saw twenty-four poor wounded soldiers, twelve on each side, the windows at each end of the ward widely open, with the wind blowing freshly through. They stopped a moment, looked a little surprised, shuddered, but said nothing. On entering ward No. 2, they found the same state of things, and immediately called out "*fermez les fenêtres.*" It was explained to them that our only hope of preventing purulent infection was free ventilation. They declared that we would endanger the lives of our patients by the *courants d'air*, which would produce pneumonia and local congestions. As each of us held such opposite views on the subject of ventilation, under existing circumstances, the inspection here ended, and the high officials turned and retraced their steps.

"We have had several cases of tetanus (six or seven), and it at one time occurred to me that our free ventilation might have predisposed to it. But, on inquiry, I find that it was relatively more frequent in other ambulances, both French and German, than it was in ours, and I am now satisfied that our open windows had no special influence in producing it."

Dr. McCormac speaks of the kindly and harmonious feeling existing throughout the corps, and, though over-tasked, and exposed to the privations which so many of our own number remember as consequent on life in the field, they accomplished a large amount of earnest work in the cause of humanity.

Referring to Dr. Marion Sims, he says:—"I cannot sufficiently express my recognition of the active, invaluable assistance rendered by Dr. Sims. He was little short of omnipresent, and his thoughtful, kindly counsel was appreciated, as it ought to be, by everyone."

From The Canada Journal of Dental Science.

ALUMINUM AS A BASE FOR ARTIFICIAL DENTURES.

By G. V. N. Relyea, L. D. S., Belleville.

Having frequent communications from dentists in relation to the aluminum work, (as to my opinion and *modus operandi*), and having had some considerable experience in that line, I purpose in a very brief way to give my system of mounting, and my reasons why I consider aluminum preferable to rubber, gold, or even continuous gum work. It must not be supposed, however, that I have any thing new to introduce; on the contrary it is the old system of swedging and then attaching the teeth with vulcanite. The clasps can be attached in the same way. I may say, however, that I never perforate, but simply serrate, as it does not weaken the plate, and the rubber does not show on the under side.

Aluminum is better than rubber because it is stronger and can be made as thin as gold. It is preferable to gold, for the following reasons: First, there is less labor in putting up a set; second, there is no danger of the plate warping, which it will do more or less in all cases when all gold is used; third, it can more readily be kept clean; fourth, it is smoother to the tongue. Continuous gum work is unquestionably the most beautiful style of artificial denture, ever made, but it is unavoidably heavy; there is the same danger of warping as in gold work, it is more readily broken should it drop and infinitely more trouble in repairing.

Whatever merit rose pearl, or more properly Pyroxyline, may possess, it is in its present state too tedious, complicated and uncertain for general use. Finally, there is unquestionably nothing hitherto used that will give a better fit then the odious rubber, but in this particular feature, combined with its exceeding cheapness, centres its whole merit. I do not use aluminum exclusively, nor to any very great extent, but where strength is required I find it the best and most reliable adjunct that has yet come into my way.

OBITUARY.

We learn through Dr. J. W. Dennis, of San Francisco, of the death of Dr. F. A. Park, of that city, aged fifty years. He commenced practice about 1840, and has been for a good many years a resident of the "Golden State," a part of the time, however, engaged in other business, but for some years past he has been actively engaged in the practice of his profession. He was one of the most active and energetic men in the profession, and did much to forward the organization of the San Francisco and California Dental Societies. Dr. Dennis testifies to his worth, as a man, as follows:

"He was a worthy, honorable and congenial gentlemen, and an example of what a man can be and can do, when love and truth are the guidance of his heart."

FINANCIAL.

We call the attention of those of our subscribers who are in arrears for the Journal, to the bills sent in the present No.

We hope our friends will not throw them aside till *to-morrow*, for these to-morrows never come.

By sending the small amount due now, our printer can be paid punctually, but if put off till to-morrow, the treachorous memory refuses to bring them again to mind, and they are too apt to "sleep the sleep that knows no waking." But our printer's bill will not sleep.

THE WISCONSIN STATE DENTAL SOCIETY

Will hold its semi-annual meeting at Madison, Wisconsin, on January 10th, 1871.

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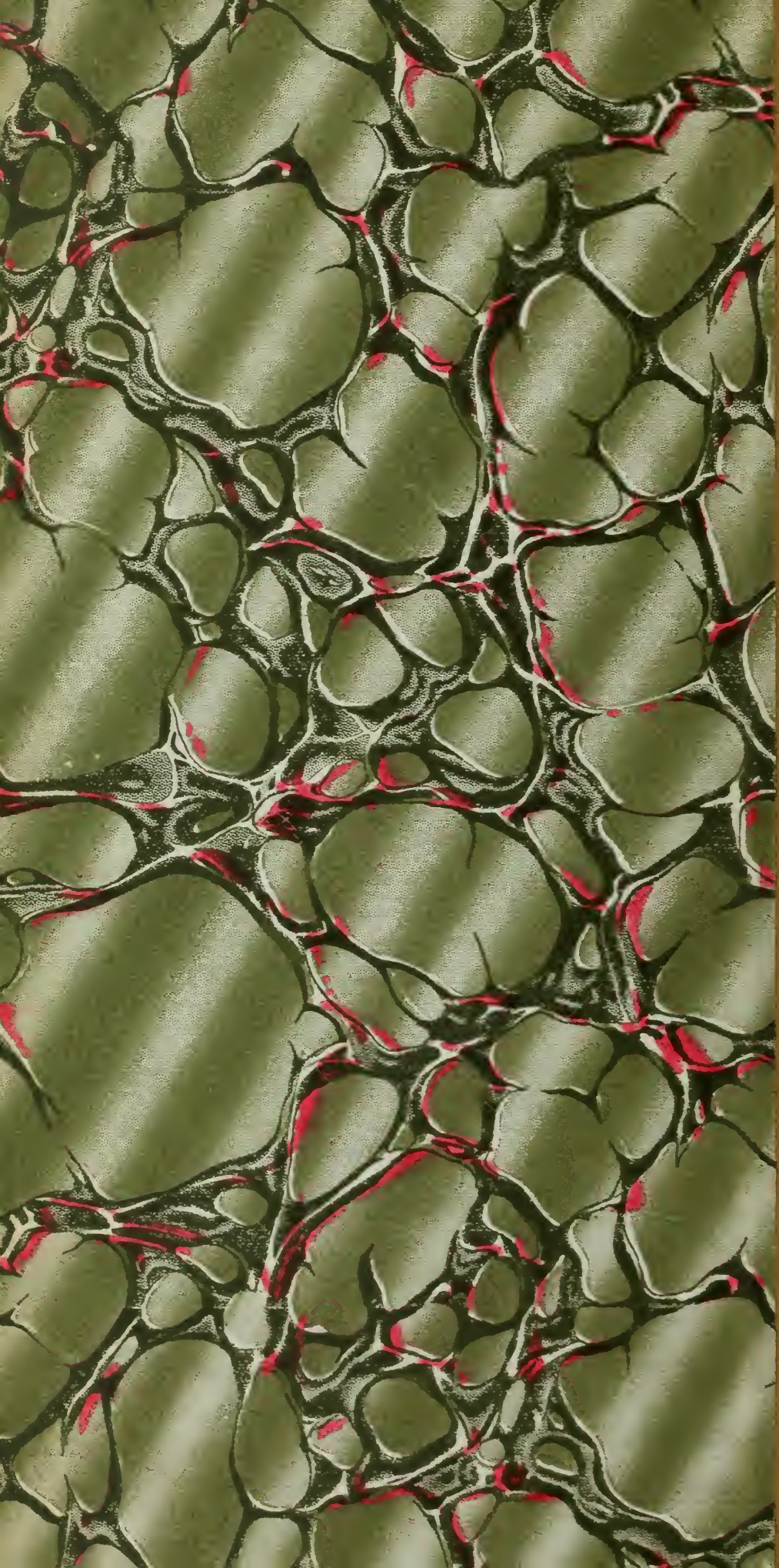
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